

amateur radio



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APRIL

1967

25c

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3B4	\$1.45	6CM8	\$2.35	6Y7	50c, 5-62	832A	\$5.00	VU39A	50c

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6G6	75c	7W7	35c, 8-42	934	50c, 5-62
6G6G	\$2.50	12A5	50c	965	50c
6HG7 & Metal	12A7	50c	50c	966	50c
6H7	12c, 12 for \$3	12A7T	75c	963A	30c, 5-62
6J5GT	\$1.00	12A7T	\$1.50	1015	\$1.50
6J5	75c, 3-62	12A7T	\$1.50	1025	50c, 5-62
6J7G	50c, 5-62	12A7V	75c	1026	50c
6K3	\$1.00	12B5	75c	1029	50c
6K7	50c	12C3	50c	1036	75c
6K8GT	\$1.25	12E5	50c	1037	\$2.50
6K8 Metal	\$2.00	12E5GT	\$1.00	1051	\$1.00
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6N7	50c	12E7G	75c	EA50	10c, 10-61
6R7	75c	12E7K7	75c	EC28	\$2.00
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"AMATEUR RADIO"

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FEDERAL COMMENT

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COMMUNICATION BREAKDOWN?

Without really thinking, most Amateurs probably agree with the proposition that communications is their hobby. In a sense the proposition is, of course, completely accurate.

Yet a failure of communications is probably a fundamental cause of many of the things that worry Amateurs and cause concern within the Amateurs' organisation. The failure on the part of the organisation to communicate to its members what it has done, or has not done—and why; the failure of the members to communicate to their organisation what they wish to be done—and why; the failure of Amateurs to communicate to non-Amateurs what Amateurs are, what they do and what they can do; the failure of one Division to communicate to another Division sufficient information so that the one can at least appreciate the other's point of view—all these are failures in communication.

Failures in radio communication can occur not only because of transmission failure, but also as a result of a failure in reception. This is also true of the communication of facts and ideas between people. The repetition of incorrect information is also evidence of a communication failure.

On these failures are built misunderstandings, for we criticise and are criticised on the basis of wrong information or insufficient information. From this, resentment follows naturally and tolerance disappears. Misunderstandings, criticism, resentment and lack of tolerance are all factors that result in the weakening of any organisation.

Maybe we, as communicators, should be able to pride ourselves on our communications. Can we?

—JOHN BATTRICK, VK3OR, Federal Secretary Elect.

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W.I.C.E.N. IN TASMANIA DURING THE BUSH FIRE DISASTER

GREG. JOHNSTON,* B.Sc., VK7ZKJ

Date: February 7, 1967; **Time:** about 1215 E.A.S.T.

Location: Hobart area.

Situation: Temperature 100+°F., winds gale force from north. Commercial radio sources calling for volunteer firefighters for many areas all around southern Tasmania. Smoke haze thickening rapidly in city area.

HAVING thus set the scene, it is not remarkable that the 6 metre mobile net frequency was well occupied from about 1215 E.A.S.T. and about two hours later was being used in earnest by several mobiles. About that time the first attempts at organisation were made when, after consultation with Tom VK7AL and after ascertaining that phone exchanges were jammed, lines were down and power off in many suburbs, Dave VK7ZMD was sent into the Fire Brigade Hq. with 6 metre mobile gear to relay direct to them fire reports from mobiles moving around trouble spots lacking telephone communications through fire or exchange overload. When the Fire Brigade personnel realised that they could no longer use the information being relayed to them, due to complete occupation of all their personnel and resources, VK7ZMD was relieved of duty.

At about this time the official P.M.G. station, with the R.I. on the mike, came up on the 6 metre net frequency and informed all stations that they were officially urged to continue to handle distress traffic.

This gets us to the point where but one commercial radio source was still

* 3 Anglis Street, New Town, Tasmania.

on the air broadcasting a continual stream of queries and requests for firefighters. Someone, I don't know who, suggested we put a base mobile outside the studio of this radio station (7HT) and use the mobiles to try and assist them in the job they were doing. One query satisfied after a short relay, due to power lines across the road, concerned the fate of the children from the Tarroona Primary School. They had been evacuated to the beach in a timely move by their teachers and were being looked after. No doubt the parents of these children were very relieved to hear this news come back over 7HT after a 6 metre VK7ZKJ to VK7ZBJ to 7HT relay. All commercial communications were out into Tarroona area.

At about 1700 hours the President of the W.I.A. (Tom VK7AL) approached the Police and offered our services as a going concern. About two hours after, Tom received a telephone call from the Police asking for help with communications into Huonville. At this stage we were able to inform them that the situation had been taken in hand by our organisation working in conjunction with Civil Defence and that communication should shortly be available.

NETS ESTABLISHED

Also at 1700 hours Lee VK7KC contacted Jack VK7JB on 3590 Kc. with the upshot being that VK7JB went to Civil Defence Headquarters only to find Ted VK7EB in attendance with equipment half set up on 3590 Kc. Shortly after this, at about 1715 hours, VK7KC and VK7EB set up a 3590 Kc. link with VK7KC also linking through on 6 metres to most of the mobiles from his own mobile. At approx. 1730 hrs. VK-

7ZKJ arrived at VK7KC's QTH with a.c. operated 6 metre rig and installed it as base station for the mobile net on 53.035 Mc. Thus by 1730 hrs. we had W.I.C.E.N. control station linked to Civil Defence Hq. on 60 metres. Civil Defence in turn had facilities for distributing the information W.I.C.E.N. obtained to the appropriate quarters.

Very soon after this, with situation reports coming in rapidly and finding coverage was not up to the mark on 6 metres because mobiles were getting too far out of the city area, a relay station was set up on Mt. Rumney by Barry VK7ZBJ and Ron VK7ZRO at about 1815 hrs. Mt. Rumney was burnt off prior to this, but was dangerous with trees coming down over the road — it is situated east of Hobart overlooking the airport and so situated as to be a highly favoured location for extended 6 metre ground wave communication.

Thus by 1815 hours W.I.C.E.N. had set up 6 metre facilities allowing communication over a radius of about 30 miles from Hobart, had several 6 metre mobiles in trouble spots sending in situation reports, several more mobiles standing by, and a 3.5 Mc. link from W.I.C.E.N. Control to Civil Defence Hq. relaying information coming in on 6 metres for routing to Police or other services.

By 2100 hrs. VK7ZZ, VK7MF and VK7DR were handling traffic on 40 metres in relation to P.M.G. communication replacement requirements.

As the roads were very dangerous in most areas outside the metropolitan area with bridges burnt out and power and phone poles coming down across the roads, all mobiles were recalled at approx. 0100 hrs. Feb. 8 after many



View of burnt out Springs Hotel. Cover photograph shows the remains of the hotel with Mt. Wellington and L.V. mast in background. Hotel was double story, unlicensed, tourist stopping place for morning and afternoon tea half way up Mt. Wellington.



Civil Defence Headquarters, Public Buildings, Hobart.
Rear: Jack Ratchelor, VK7JB.
Front left: Crosby Russell-Green, VK7CR.
Front right: Ted Cruise, VK7ZJ.

operators had sent in information indicating the situation in most of the disaster areas via W.I.C.E.N. control to the Civil Defence Hq. and thence the Police Commissioner as head of the emergency operations. Communications were not established with Huonville on Feb. 7 as all roads into the area were impassable when our assistance was requested. W.I.C.E.N. Control and Civil Defence link (C.D. link) closed at approx. 0215 hrs.

All links and relays were operational again by 0900 hrs. on the 8th. Several 6 metre mobiles were on standby and several others active, in some cases in areas which had been lacking any communication for 24 hours. Many hours were wasted by three mobiles who were despatched to pinpoint a fire reported in the Carlton area in three separate bogus reports to the authorities who requested us to confirm or otherwise.



W.I.C.E.N. Control at the residence of VK7KC. Lee Cordell, VK7KC, at the mike.

As fire relief centres were set up in the country centres, mobiles endeavoured to contact their organisers and transmit back any urgent food and clothing requirements they had.

Two mobiles with 6 and 80 metre equipment were set up in Huonville during the late afternoon and while Winston VK7WH was getting set up to relay on 6 after QRM from Amateurs outside VK7 had forced closure of the direct Huon-Hobart 3590 link, Terry VK7CT was passing distress traffic on 3590 per c.w. to VK2AGH who then relayed to W.I.C.E.N. Control VK7KC. Many thanks VK2AGH for your assistance on this occasion.

Very satisfactory 6 metre communication via Mt. Rumney relay to W.I.C.E.N. thence C.D. Hq. was established soon after this and a considerable amount of Police and general distress traffic passed. While this was going on further traffic was coming back through the Mt. Rumney link into W.I.C.E.N. Control from four mobiles in the Carlton to Tasman Peninsula area—the first news back into C.D. Hq. from there since the fires cut the telephone lines into the area.

All mobiles were recalled from their areas at 2225 hrs. and the Mt. Rumney link closed as soon as all units were

in direct communication with W.I.C.E.N. Control at 2300 hrs. Up until this time additional traffic was coming through Mt. Rumney from Mike VK7ZMC who set up a base station with his 6 metre mobile at the Woodbridge relief centre—this was the sole communication service available in the area south of Snug.

Also on the 8th, from 1100 to 1415 hrs., VK7ZZ was handling traffic to mainland VK for the Departments of Social Services and Labour and National Services, broadly concerned with damage and staff requirements.

EXTRA RELAY STATION INSTALLED

The situation continued virtually unchanged on the 9th with the exception that to provide against overloading the 6 metre frequency at the Mt. Rumney relay site, at peak traffic periods an alternate 2 metre link from this site

motor driven generating plants. This h.f. link between Richmond and Colebrook was maintained until 1800 hrs. on 14th February.

By Saturday 1100 hrs. (i.e. 11th), this h.f. point to point link was integrated fully into the W.I.C.E.N. system with the installation of a complete station on Mt. Wellington by John VK7ZJG, assisted by VK7ZKJ, at the premises of TVT6 transmitter and we were fortunate to have been able to "borrow" quarters and 240v. a.c. from their emergency generating system. Our thanks are due to TVT6 for allowing us to use their facilities during this period.

Thus was set up a relay station capable of reception on any Amateur frequency up to 2 metres and capable of patching the received signal to W.I.C.E.N. Control and C.D. Hq. simultaneously on 6 and/or 2 metres merely at the flick of a switch.



Traffic being handled at W.I.C.E.N. Control. Rear: Lee VK7KC; foreground: Ian (Associate).

to W.I.C.E.N. Control was installed, leaving 6 metres for use on inward traffic from mobiles to the relay station only. A second operator then put it down to W.I.C.E.N. Control via 2 metres. This, of course, doubled the traffic handling capability of the Mt. Rumney relay.

All v.h.f. distress traffic units and h.f. personal third party units closed by approximately 0100 on 10th February to allow the operators and gear to cool down for a few hours as traffic had slowed to a mere trickle at that time. All channels were again opened by approx. 0815 hrs. with an extra link, this time point to point via h.f. (3590 Kc.) between Richmond and Colebrook—again to be the sole communication link available. Units at both towns were also equipped with 6 metre mobile equipment which was used to relay via Mt. Rumney back to W.I.C.E.N. Control and C.D. Hq. when QRM or QRN prevented direct reception of 3590 Kc. traffic at W.I.C.E.N. Control. This meant virtually all the time in daylight hours as the h.f. equipment was QRP d.c. operated a.m. gear which was replaced as demand proved the necessity on 13th February by high power sideband transceivers on the 3590 Kc. channel powered by petrol

In view of the predicted high fire risk in Northern Tasmania, the Mt. Wellington link also established a link through to Mike VK7ZMC/M on Mt. Barrow in the north on 55.035 Mc. net frequency, again with patch facilities available to W.I.C.E.N. or C.D. in case it became necessary to use it.

With the sophisticated monitoring and patch relay systems installed on Mt. Wellington, the relay on Mt. Rumney became largely redundant and was closed down, after being almost continuously manned for four days, at approx. 2000 hrs. on 11th. During this time almost all operation was on batteries as the 240v. a.c. supply was cut very early by fire on 7th. D.C.A. personnel did allow our operators to borrow 240v. a.c. from their emergency set on Mt. Rumney spasmodically.

MOBILE UNITS WITHDRAWN

By 1900 hours on the 12th, all mobile units had been withdrawn as their services were no longer required, but the portable units at Colebrook and Richmond were still very active with point to point traffic on h.f., with Richmond now having telephone facilities into Hobart at times. Mt. Wellington remained open until 1800 hours on 13th for relay from these stations should

telephones fail again, as was occurring frequently prior to this.

Thus things drew slowly to a close at 1800 hours on February 14 when all links were closed as services were largely restored and our assistance was no longer required, although an Army unit borrowed much of the equipment on Mt. Wellington for their use in a station they set up there.

Many questions arise at the conclusion of such an operation. Thanks are due to many. It appears to me to be a risky procedure to attempt to single out more individuals than has already been done, however the work of Lee and the team of very willing workers who assisted at W.I.C.E.N. Control (VK7KC) and of Lee's XYL who fed goodness knows how many people each day and put up with so many relative strangers in and around the home for a full week must be acknowledged with thanks.

The key to the entire operational success was the enthusiasm and selflessness of the operators and assistants of the 22 6 metre mobile stations used at some stage during the operation and who proved, for the first time, the extreme versatility and utility of 6 metre net operation in W.I.C.E.N. work, while the whole competence of the communications was rounded off by the support of the 10 or so h.f. mobile and portable stations which did such good work in providing fixed point to point services. The added 2 metre relay and patch facility boosted the total traffic capacity of the system by 100%. Backing the whole emergency operation were many Associate W.I.A. members and

even friends of Amateurs who assisted throughout as scribes and of course the h.f. home station operators throughout Australia who helped wherever they possibly could in every respect.

One hopes that the authorities will now realise and recognise, at least in some part, the high potential value of our mobile "feet" when coupled with the normal fixed station network already in existence, during any state of civil emergency such as that just past.

LESSONS LEARNED

In retrospect, what did W.I.C.E.N. achieve and how fast once the situation became one of extreme emergency? Well quite spontaneously a 6 metre mobile net controlled first from the Fire Brigade Headquarters and later from near 7HT studios was operative within the hour of the state of emergency being proclaimed. Within a further 3 hours the 6 metre mobile network was under W.I.C.E.N. Control from VK7KC's establishment, using the call VK7ZKJ, and the whole system was integrated into supplying situation reports to Civil Defence Hq. by an h.f. (3590 Kc.) link from VK7KC to VK7EB. Civil Defence in turn had personnel and serviceable telephone outlets for distribution of traffic sent in by W.I.C.E.N. to their Hq.

The speed with which W.I.C.E.N. got so thoroughly organised was a tribute to those Amateurs concerned, and demonstrated once again the need for radio as a back up for line communications. Here the telephone proved to be extremely vulnerable under the circumstances.

What else did we learn as a result of our activity? First and foremost we found out that the v.h.f. mobiles, assisted by relay stations, could cover the entire disaster area for traffic or situation reporting and apart from the availability at very short notice of so many mobile units (approx. 25) around Hobart, the 53 Mc. net frequency was not subjected to QRM from fellow Amateurs not involved in the emergency. Further, that when backed up by 2 metre portable or mobile, a 6 metre relay station could really handle traffic by using one frequency for inward and one for outward traffic simultaneously.

What did we need? First and foremost direct telephone lines to both C.D. and Police Hq. from W.I.C.E.N. Control, to leave yet another channel clear (i.e. 3590 Kc.) for emergency traffic and as a standby channel should all traffic lines go out. Secondly, and most important, W.I.C.E.N. requires a permanent headquarters on perhaps W.I.A. property with permanent installations of v.h.f. and h.f. equipment; direct telephones as mentioned before; ample space to park up to 25 mobile units on standby; a substantial petrol dump (bulk), and a supply of four-gallon or thereabouts containers for mobiles' use; auxiliary generating set; several battery chargers, and sleeping and cooking accommodation for at least three operators.

Well that seems about the story as I saw it from the very early stages of the emergency and although I hope never to see another such emergency, the experience with W.I.C.E.N. was a most valuable one.

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A SYNTHETIC BATTERY FOR YOUR CARPHONE

(or how to make Transistor Regulated Power Supplies)

RODNEY CHAMPNESS,* VK3UG

PART TWO

AS promised, here is some information on a higher current rating 8 to 22 volt regulated power supply. The previous two supplies (described in Part One, "A.R." Feb. 1967) could produce only up to 12 amps. and this only at an intermittent rating. The supply described in this article will put out 15 to 16 amps. quite comfortably for periods up to half an hour at a voltage output of 13.5 volts, and put out continuously 10 amps. At voltages higher than about 13.5v. the current available is reduced as the average voltage across C6 is reduced as the current increases and vice-versa.

The circuit in diagram one is very similar to the second supply in the previous article with a few circuitry changes. This supply is not capable of such high output voltages (22 volts max.) as the previous one, which will supply up to and slightly over 30 volts at low loads. This previous one is, therefore, possibly more suitable to supply power to quite a lot of mains-operated transistorised gear. These in many cases use in excess of 20 volts.

There are two pilot lights, one to indicate normal operation and the other to indicate an overload condition. The output transistors have been increased by one to four and there are two Ferris 7003 heat sinks with these transistors mounted on them. There are now two output controls, one is preset on 13.5 volts and the other is a variable coming out to the front panel.

* 14 Buckley St., Sale, Vic.

I have shown an amp. meter and a volt meter in the circuit; the amp. meter is possibly not essential, although handy; the volt meter I feel is quite essential if variable output voltage is to be used. It is not always convenient to use an external volt meter for this purpose. The variable voltage output control can, of course, be approximately calibrated and for most purposes would be quite adequate, so please yourself on this.

R19 is an additional resistance, fitted so that a 12 volt battery can be safely charged at a maximum rate of between 10 to 12 amps., which will automatically taper off to a trickle charge when the battery reaches full charge. This I think you will agree is a handy addition to the unit. R19 is a bit of a problem and about the only way out of it is to use four 1 ohm 10 watt resistors in parallel.

The continuous output current of the supply is limited to about 10 amps. (the rating of the transformer), although it supplies 15 amps. with no qualms. To boost the continuous output current rating, a 4 amp. 17 volt transformer of the type used in the smaller power supply in the previous article could be wired in parallel, so giving a continuous rating of 14 amps. The size of R19 could be reduced then to about 0.2 ohm, and would consist of five 1 ohm resistors in parallel.

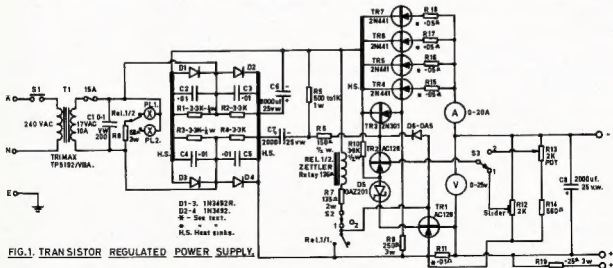
Now to charge a flat 12 volt battery to a terminal voltage of say 14 volts, at a maximum current of say 12 amps., we will need a resistance in series with

our flat battery to limit the current flow and charge rate, otherwise the overload circuits would most likely operate and the battery certainly would not charge. A flat battery should not be flatter than 11 volts. Now we have a 3 volt difference between the voltage of the supply and the battery, so a resistance is inserted between supply and battery to limit the maximum current. Using Ohm's Law: $E \div I = R$, then 3 volts \div 12 amps. = 0.25 ohm. Therefore the series resistance is 0.25 ohm.

At the beginning of the charge the current is 12 amps., but when the battery reaches 12 volts the charge drops to 8 amps.; when the voltage rises to 13 volts the charge rate has dropped to 4 amps., and when the battery voltage has risen to 14 volts (the supply voltage) there is no charge although in actual fact there will be a small trickle charge. We now have a tapered-charge battery charger, and so the motto is "set it and forget it".

As can be seen, the circuit is virtually identical with the previous one. The main differences are in some component values due to the different voltages and currents put out. It would be quite possible to fit an additional 4 amp. transformer into the supply and I have left room in mine for this addition. All the outputs go to 2-pin polarised plugs.

I had said that I would possibly incorporate a more sophisticated overload circuit, but due to circumstances, mostly lack of time, I haven't developed



*R11-J8 B. & S. enamelled copper, approx. 2 inches long. Adjust length for diode OAS (D6) to conduct at pre-determined overload current between 15 and 18 amps.
*R15, R16, R17, R18-3 feet of 30 B. & S. enamelled copper wire.

S1-Mains off/on.
S2-Overload re-set: (1) normal, (2) re-set.
S3-Output volts: (1) pre-set volts (13.5v.), (2) variable - volts.

When overload occurs, Zettler relay pulls in and changes over pilot lamps attached to Rel. 1/2, and clamps output volts to virtually zero.

these circuits. Diagram 2 will give the general idea of the circuit I had intended trying. TR1 is still the overload control transistor but in its collector lead is just resistor R23 instead of the relay and R7. Until D6 commences conduction, TR8 and TR9 are cut-off. When D6 conducts, current flows through R20 and the voltage drop across R20 causes TR8 to conduct.

In the collector lead of TR8 is a resistor (R21) which will also have a potential difference across it. This voltage is applied to a CR network consisting of R22 and C9. Should an overload occur, C9 will charge up to 63% of the voltage across R21 in about 3 seconds, and TR9 will gradually commence conduction during this three seconds and about this time the collector current will have risen sufficiently high to pull the overload relay in. So with an overload only extending for a couple of seconds or so, the overload relay won't pull in, so saving having to re-set.

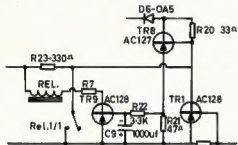


FIG. 2. OVERLOAD CIRCUIT.

Another advantage I can see is that the overload operation of TR1 is amplified by TR8, giving a much sharper overload cut-off characteristic as indicated by my simple graph in Diagram 3. Of course this overload circuit may not work as well as I feel it should, but it is a starting point for experiments. I have seen much more complicated circuits for supplies of this type, using about twice as many transistors as I would suggest, and a lot more complication. Note that TR8 is an NPN transistor. I have also been giving some thought to an automatically re-setting overload circuit but have not got to the stage of being able to draw up working circuits.

The emitter resistors of TR4 to 7 are 3 feet of 28 B. & S. enamelled copper wire, and the resistor R21 consists of a few inches, about 6 to 8 inches, of 18 B. & S. enamelled copper wire. The length of this is adjusted until D6 just commences to conduct at the overload point, which in the case of this supply is between 16 to 18 amps. For the fuse holder, don't use a panel mounting type, as I did, or you may find after high current has been drawn for a while that the ends of the fuse melt and boy, you are in trouble. I'm using a screw terminal board with two lugs as my fuse holder.

I feel I may have been in error in my previous article with my supposition as to why equalising capacitors and resistors are necessary across series

connected silicon diodes. I feel the following explanation is nearer the truth.

When the diodes are in the non-conducting state they act as small capacitors. Now say one diode has an effective capacity of 90 pF, and the second in a two-diode train has a capacity of 10 pF. The p.i.v. of each is say 60 volts and the total theoretical p.i.v. is 120 volts. We apply a source of voltage which will give a p.i.v. of 100 volts. The diodes are safe—or are they? No, because the p.i.v. will distribute in inverse proportion to the capacity, therefore we have 90 volts across the 10 pF diode and 10 volts across the 90 pF diode. Puff goes number one through excess volts; when it's gone, puff goes number two, as it will probably have to take the whole load. Sounds a lot more feasible than my other explanation. The quoted capacities are not necessarily correct, they are just to illustrate the point.

Another possible explanation I have heard of is that the leakage current across the diodes in the non-conducting state causes the p.i.v. across the diodes to be unequal, so which is actually correct I'm not really sure. Perhaps someone with more knowhow on diodes may be able to enlighten us all, but in the meantime fit the equalising capacitors and resistors to be on the safe side.

Well that is about the lot for this article. I am hoping to write a further article on an a.c. supply for the 122 set. This will include a simpler transistor regulated 12 volt d.c. supply as well as a normal h.t. supply. At the moment I anticipate it will only use one transistor.

I hope that these two articles on transistor regulated supplies have been a starter for those who have always wanted a replacement for the lead-acid accumulator. The ripple at full load with the supply described is between 25 millivolts and 50 millivolts.

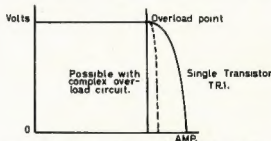


FIG. 3. POSSIBLE OVERLOAD CHARACTERISTIC OF VARIOUS OVERLOAD CIRCUITS.

"SUPERGAIN" ANTENNAE

One of the perennial dreams of most Hams is a high-gain antenna occupying practically no space—something that will give lots and lots of decibels but be no more cumbersome than a weathervane. During the past several years, the theory of such antennae has been pretty well worked out and it is now established theoretically that any desired degree of directivity can be obtained in an antenna array less than a half wavelength long. Antennae of this sort have been termed "supergain" arrays.

No one has built such an antenna. Furthermore, it appears that no one ever will. The painful practical fact is that, considering an array of given small over-all dimensions, increasing the directivity and gain decreases the radiation resistance at a tremendous rate so that the antenna efficiency goes down very much faster than the gain goes up. In addition, the spacing between elements and phasing and amplitude distribution of the currents in them becomes impossibly critical.

A paper in the Proceedings of the I.R.E. (N. Yaru, "A Note on Super-Gain Antenna Arrays," Proceedings of the I.R.E., Vol. 39, No. 9/9/51) treats quantitatively a particular type of array, one having a number of half-wave

elements in broadside with the array length limited to one-quarter wavelength, and comes out with some astonishing answers. With the proper current distribution between elements in each case, the power gain over a single element is almost the same as the number of elements, e.g., with five elements the power gain is approximately 5, with 9 elements the gain is nearly 9, etc., and presumably would continue to increase in the same fashion beyond the nine elements which represent the limit of the author's curves. These gains are not especially high as compared with larger antennae, but it should be noted that the broadside case considered is probably not the most favorable one for small dimensions.

From the practical standpoint, the significant thing is that the analysis shows each element of a 9-element array would have to carry a current of about 14 million amperes in order to produce a field strength, at a distant point, in the most favorable direction, equal to the field produced by a current of 19.5 milliamperes in one element alone! Practically speaking, of course, such a tremendous current would be an absurdity. Further data is given based on the calculated ohmic losses

(Continued on Page 15)

A "CORNER" ANTENNA FOR 7 Mc.

WAL SALMON,* VK2SA

THE success of the "corner" series phased array described by the author in "Amateur Radio," in October 1966 prompted him to think in terms of a "corner" antenna for 7 Mc., with possible harmonic relationship on 14 Mc. A number of letters were received by the author in connection with the article and several Amateurs asked for details of an antenna for 7 Mc.

The author has always held the view that it is most desirable to endeavour to get some added gain in the desired direction when planning a wire antenna and so far as 7 Mc. is concerned, the ordinary Ham living on a suburban lot cannot think in terms of Yagis or Quads for 7 Mc.

However, the shortened centre loaded dipole will fulfill most requirements so far as directivity and DX is concerned on 7 Mc. and such an antenna to fill the bill has been constructed at VK2SA and was erected on 9th October, 1966, as a vertical series array, and on 11th October was re-erected as a "corner" antenna on the 52-foot mast at VK2SA.

The antenna consists of two centre loaded dipoles fed with open wire line and spaced 20 feet apart at the dipole centres. The phasing stub is inductively loaded with 14 turns of 16 gauge enamel wire in each leg, both being wound side by side on a 1½" plastic tube (see Fig. 3). Before connection to the antenna, the stub is shorted at

one end and the free ends snipped until the g.d.o. dips at 7 Mc. The total length of the stub was then 20 feet.

The reader might ask why the stub was shortened by inductive loading. The reason was due to the fact that in order to design the "corner" antenna to fit in with space available, a scale diagram of 10 feet to 1 inch was drawn and the dipoles came out at 42 feet each and the stub 20 feet, so there are

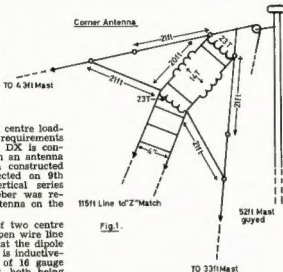


Fig. 1.

now no worries about the 67-foot deal for 7 Mc.

The dipoles were then constructed and it was found that for a wire of 21 feet each side of the coil former, a close spaced coil of 23 turns 1½" diameter was necessary and both dipoles were dipped at 7 Mc. before connection to the stub and feed line.

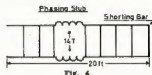


Fig. 4.

Fig. 1 shows the "corner" antenna as erected at VK2SA. Fig. 2 illustrates the centre loading coil in each dipole, and Fig. 3 shows the electrical shortening coils for the 20-foot stubs.

The stub should be dipped at 7 Mc. with one end shorted as shown in Fig. 4. On 7 Mc. the s.w.r. is 1.1 to 1, and on 14 Mc. from 1.3 to 1.5 to 1.

Using the antenna in the favoured direction of North East, S8 reports have been received from W7 land on a.s.b. and c.w., and a.s.b. S7 from Japan, all on 7 Mc. On 14 Mc. an a.s.b. S8 to S9 report from YV5, S7 from W, S6 from TI2. All reports were over a three-day period commencing 11th October, 1966.

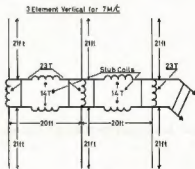


Fig. 5.

Ever heard of a three element vertical for 7 Mc.? I tried the two element for one day, but if you want to give your friends overseas something to think about, turn to Fig. 5. Just hang it from a wire broken with insulators about 45 feet high. If you really want to go to town and do the thing properly, why not use the stub line as the horizontal support between two masts and let the thing hang down in the form of three driven inverted vee antennae for 7 Mc.

Give me a call some time and let me hear the noisy brute!



Fig. 2.—Centre loading coil in each dipole.



Fig. 3.—Shortening coils for 20-ft. stubs.





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Primary: 10-0-200-220-240-260v.

Secondary: 190v. tapped at 170v. at 100 mA.; 55v. at
10 mA.; 12v.-0-12v. at 130 mA.; 6.3v. at 4a.; 6.3v.
at 4a.

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\$3.00 plus S/T 12 1/2% + Pack and Post 50c.

AUDIO TRANSFORMERS

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Primary: 12,000 ohms p.p.

Secondary: (1) 150 ohms, (2) 150 ohms. Total 3 watts.

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TRANSISTOR TRANSFORMERS

A & R TYPE 2675

Primary: 25 ohms.

Secondary: 150 ohms at 5 watts, with feedback winding.
Originally for outside broadcast use—response 30 c.p.s.
to 15 Kc.

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SPEAKER TRANSFORMERS

A & R TYPE 2655

Primary: 5,000 ohms s.e.

Secondary: 33 ohms (similar to E Type Rola).

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Rola Type LDR43. 4300/600 ohms c.t.

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Power source—6 volts.

Gain: 70 db.

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Supplied with circuit and wiring instructions.

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Including resistors, mica condensers, tubular condensers,
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K. A. KIMBERLEY,* VK2PY

PART TWO

IN my previous article ("A.R." Nov. 1966) I outlined a transistorised sideband exciter. A lot of fun has been had playing around with it, as well as learning something about the behaviour of transistors in the practical sense.

The use of a 9 volt battery precluded the chance of electric shocks, but, as in valve (that's a rude word today!) jobs, it is wise to switch off before making adjustments to the wiring. Transistors have an irritating habit of not liking stray a.c. currents originating from the soldering iron. Likewise shorts from the main supply rail to

Direction—All windings wound in a clockwise direction when viewed from below.

T1, T4—Primary: 80 turns, tapped at 14. Secondary: 2 turns wound over primary.

T2, T5—Primary: 2 turns wound over secondary. Secondary: 40 plus 40 bifilar

T3—Primary: 80 turns. Secondary: 7 turns wound over primary.

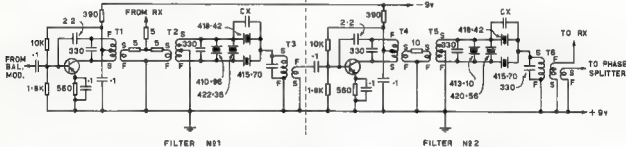
T6—Primary: 80 turns. Secondary (1): 7 turns wound over primary; secondary (2): 7 turns wound last.

Note: Coil data for alignment oscillator will be given later.

90° from the can side and soldered on to the appropriate eyelet.

It will be noticed that the earth (pos.) rail runs down one edge whilst the neg. supply rail along the other. All wiring is done in stretched 20 gauge tinned copper and should be positioned as in diagram. The filter is built into a shielded box $6\frac{1}{2}$ " (long) x $2\frac{1}{2}$ " (wide) x $2\frac{1}{2}$ " (high), open at top and bottom.

The crystals could be mounted in special sockets or metal valve sockets, however these also cost money so I used the hint as shown on the front cover of a back issue of "A.R." (Oct. 1963).



base kills them faster than one can say "E— it." I know! I found out the hard way.

THE FILTER

I hope the preamble has been short enough as there is a lot of meat to follow. As one would imagine the filter is really the heart of this project so therefore some care should be taken during its construction. Have a good look at the circuit and layout drawings before commencing.

WINDING DATA FOR FILTER

I.F. TRANSFORMERS



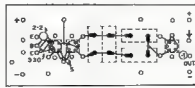
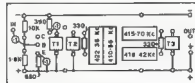
FILTER TRANSFORMER DETAILS

Formers—Ducan miniature i.f. assemblies
Wire—34 gauge B. & S., posyn covered wire

* S Don Steel Newtown, N.S.W.

MECHANICAL DETAILS

Figs. 2 and 3 are drawn to scale and should be a guide as to the manner in which my filter was constructed. For the base board I used scrap 1/16" laminex. Alternatively, 1/16" bakelite or matrix board (this costs money, however) could be used with equal success.



The base board is drilled and fitted with tubular eyelets where indicated by the small circles. The eyelets serve as component mounts and wiring (solder) points. The mounting tags on the i.f. transformer cans are bent to

ELECTRICAL DETAILS

The filter consists of two identical half lattice sections connected in cascade. The use of this circuit configuration does not imply superiority over others, but rather the limitations of my junk box.

All transformers were wound on Ducan i.f. transformer assemblies, using 34 gauge self-fluxing wire. T2 and T4 are bifilar wound. However commercial transformers could be used if desired, after mods. as follows: Remove tuning capacitor and replace with two series connected capacitors of double original unit. The centre tap so formed now connects to earth in lieu of coil tap as used in my filter.

Coupling between T1 and T2 is controlled by means of the five ohm resistors, as per circuit, and is not critical. These resistors will make up an isolating pad when the proposed receiver section is added.

Transformers T3 and T6 are matching transformers to couple the high impedance filter into the base of the transistor amplifier. In aligning the filter these transformers are purposely tuned away from resonance, thus vastly improving the filter pass band curve. I imagine this comes about as a result of the impedance of a parallel LC circuit reduces as it moves away from resonance and hence reaching a point where an optimum terminating impedance is presented to the output of the filter proper.

As mentioned in a previous article, the amplifier stages may not be needed

in a straight exciter. However, as they could be required for receiving, it was decided that it would be easier to install them now than later. The gain requirements here are low, so it could be wiser to connect the transistors in common base rather than common emitter. This circuit configuration has a lower gain and hence reduces the chance of "take off".

The components used are:—

Resistors— $\frac{1}{2}$ watt 20%.

Capacitors—All 0.1 uF. are 25v. ceramic (Ducon Redcaps).

330 pF. are 5% 125v. styro-seal.

2.2 pF. are ceramic NPO discs.

Cx gilmicks (approx. 1 to 3 pF.).

Transformers—Wound on Ducon i.f. transformer assemblies.

Transistors—PNP germanium types, similar to OC45, etc.

Base Board—1/16" laminex or bakelite, drilled and eyeleted as required.

Crystals—Two digit series as per text.

The crystals used at VK2PY are of the two digit series and centered around 417 Kc. Crystals at other frequencies would be equally suited provided that the tuning capacitors across the i.f. transformers were altered accordingly. Unfortunately, the use of crystals one channel apart results in the bandwidth being too narrow and, of course, as "Finnage" would have it, two channels apart the filter is too wide with a nasty dip in the middle.

This leaves us with several alternatives:—

- (1) Make do with a narrow filter.
- (2) Use crystals from the three digit series conjointly with those of the two digit series.
- (3) Adjust the frequencies of my existing two digit series.
- (4) Purchase a mechanical filter?

Again my "Scotch blood" came to the fore, thereby making alternative number 3 an automatic choice. Later I was pleased with this solution as it enabled me to learn something about shifting crystal frequencies. A short description of this will be found later in the article.

ALIGNMENT

The following procedure is included for those Amateurs who do not have a sweep generator. Those fellows who have one will need no instruction from me in the use of their own equipment. I found mine invaluable and would not now dream of aligning any receiver without it.

The following items will be necessary:—

- (1) Bandsread stable oscillator.
 - (2) Suitable detector.
- It would be highly desirable to have:—
- (3) C.r.o.
 - (4) Sweep generator.

If you do not have access to (3) and (4) then you will most certainly need:

- (5) Patience.
- (6) Perseverance.

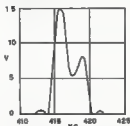
Some comments and constructional ideas will be given regarding items (1), (2), (3) and (4) at the end of this article.

Proceed as follows: Connect the detector at the output of the filter. Set generator to the mid frequency of crystals 1 and 2 and connect to the top of T5. Keeping detector set on most sensitive range, adjust generator output to give small reading. Peak T6, reducing generator output if necessary. Move generator to T4 and peak T3 in a like manner. Proceed backwards towards the input as if aligning a receiver. Beware of overload as this condition can make the pass band curve appear to be far better than it is.

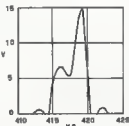
We now have to obtain some idea of the pass band curve. Of course if you have a sweep generator this exercise will be a piece of cake, however falling the ownership of same, proceed as follows: Rock your signal generator backwards and forwards over a range of about ± 5 Kc. from the expected centre frequency of your filter. Whilst doing this keep a sharp eye on the girations of the null detector meter. At this stage don't be alarmed at the variations in meter readings. Remember that a reading equal to half of the peak voltage reading represents a loss of only 6 db.

The reader will be surprised how quickly a mental picture of the pass band shape is built up in the mind. Most probably it will look something like those pictured herewith. Figs. 4A and 4B indicate that you have not aligned the i.f.s at the correct centre frequency. Note the exaggerated peaks corresponding with (Fig. 4A) the lower frequency crystal and (Fig. 4B) the higher frequency crystal. If you are lucky and have correctly picked the centre frequency, Fig. 4C will be produced, but could have large or small "pop ups" (side lobes). Remember that these curves are voltage versus frequency and will look a whole lot worse than curves expressed in db.

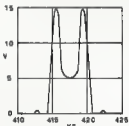
Having so far given a fair exhibition of your patience, you will now need to bring your perseverance to the fore. Disconnect filter No. 1 and feed signal into the base of the second transistor via the 0.1 uF. capacitor. Whilst still rocking and watching carefully, re-adjust T4 and T5 until the pass band looks something like those shown in Figs. 5A, 5B or 5C. Having finally succeeded in making the two peaks symmetrical, I would strongly advise



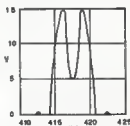
T4 & T5
TRANSFORMERS TUNED BELOW
ACTUAL CENTRE FREQUENCY
FIG. 4A



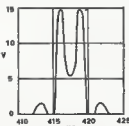
T4 & T5
TRANSFORMERS TUNED ABOVE
ACTUAL CENTRE FREQUENCY
FIG. 4B



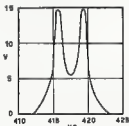
T4 & T5
TRANSFORMERS CORRECTLY TUNED
(NOT T5)
FIG. 4C



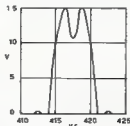
T6 INCORRECTLY ADJUSTED
CX OK
FIG. 5A



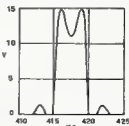
T6 INCORRECTLY ADJUSTED
CX TOO LARGE
FIG. 5B



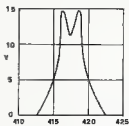
T6 INCORRECTLY ADJUSTED
CX NIL
FIG. 5C



T6 OK
CX CORRECT
FIG. 5A



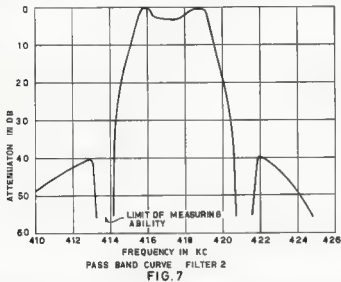
T6 OK
CX TOO LARGE
FIG. 5B



T6 OK
CX NIL
FIG. 5C

the constructor to give it away for a while. Have a beer and a smoke or even a cup of coffee or some other kind of relaxation.

When fully refreshed, it is time to tackle T6 and this should be adjusted with even more care than any of the previous adjustments. Very small changes in tuning are all that is necessary here. Dramatic changes in the pass band curve will be observed during the adjustment. If an excessive peak becomes evident on either edge of the curve, a slight fiddle with cores in T4, T5 and T6 will soon put things right. In other words you will probably gather that there is a little interaction between adjustments. Eventually everything comes good and the curve should look something like those shown in Figs. 6A, 6B and 6C. The middle dip should be about 0.53 of the peak reading, corresponding to -1.8 db or better, but should not be deeper than 0.79 (-2.0 db).



Please Note that these curves have been exaggerated somewhat to show more clearly how Cx controls the "pop ups" as well as the steepness of the sides. Generally more Cx increases the level of the "pop ups" and at the same time the sides of the filter become steeper.

It is now advisable to draw an accurate curve with the attenuation in db. Fig. 7 is the actual pass band curve of my filter No. 2. Commence by adjusting the detector so that it reads full scale at the peak of the pass band curve and call this the 0 db ref. point. Slowly move generator frequency until the detector output meter now reads 0.71 of full scale and note frequency. Mark this in on your graph as the -3 db point. Continue the frequency shift in same direction until the meter now reads half scale. This is the -6 db point for your curve. Likewise, 0.31 f.s.d. = -10 db, and 0.1 f.s.d. = -20 db. At this point it is wise to change the detector to a range that is 10 times more sensitive than the previous scale

in use. Full scale here is -20 db, 0.31 = -30 db, and 0.1 = -40 db on this scale. From the -40 db point on, measurements become somewhat difficult, however they are not really important. The 0.05 f.s.d. is at -46 db, then guess at 0.01 f.s.d. as this equals -60 db.

So much for the main lobe, keep on with the frequency shift and you will find that the meter reading will show a minor increase. This is a "pop up" and should not be more than 0.15 f.s.d. on the second scale (-36 db). Follow the same procedure for the side of the curve. If intermediate values are required for your curve, the formula to be used for calculating them is:-

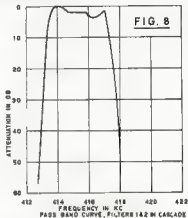
$$db = 20 \log_{10} \frac{E_1}{E_2}$$

where E1 is the full scale reading that you set as your zero ref. point.

If the curve is unsatisfactory a slight titivation of the cores should correct

be okay as the attenuation figures add arithmetically, i.e. the "pop ups" will be down a total of 60 to 70 db. That's a ratio of 1,000:1 or so!

Well chaps, the foregoing certainly sounds labourious as indeed the filter alignment, without a sweep, actually is. For those without the patience or, who cannot obtain the necessary crystals, do not overlook the idea of completing the exciter by the use of a mechanical filter.



There are many suitable mechanical filters on the Australian market and because of their small size as well as electrical parameters should be ideal.

Best of luck and good fun.

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Amalgamated Wireless Valve
Coy. Pty. Ltd.,
348 Victoria Road,
Rydalmere, N.S.W.

matters. When everything is okay give filter number 1 the same treatment. This should be a "piece of cake," having been awarded your "Hoppy Badge" for the successful completion of filter 2 alignment.

When both filters are behaving in the required manner, connect them in cascade. More than likely T3 will need some slight re-adjustment. Probably this is due to the fact that the input impedance of transistor 2 differs from that of the detector.

At this stage prepare a pass band curve with the two filters in cascade. Provided the dip in the middle of the pass band has been kept to less than 2 db, the combined dip will be less than 4 db. This is quite satisfactory and the response curve will be similar to mine (see Fig. 8). If the filter is made about 500 c.p.s. narrower than the author's, the centre dip will be almost eliminated.

Note. Don't be overworried if the "pop ups" in each filter are at only -30 to -35 db. The result will still

TRANSISTORISED B.F.O.

The b.f.o. circuit shown here can be used in new equipment, or as an add-on unit to an existing unit. Its main advantage is that no variable capacitor, as such, is used for tuning. Instead, the change in base-collector junction capacitance due to variations in the collector-base voltage is utilised, thus enabling a potentiometer to be used as the tuning control.

As there is only d.c. on the leads to the potentiometer, the oscillator may be fitted anywhere on the chassis, with long leads to the front panel causing no problem. In cases where it is desired to fit it in an existing unit, quite often an existing potentiometer, e.g. audio gain control, can be replaced by a dual concentric potentiometer in the same mounting hole. If it is required, a potentiometer with on/off switch can be used, the switch being used for b.f.o. on/off.

It might be pointed out that the 2N708 transistor was used as it was

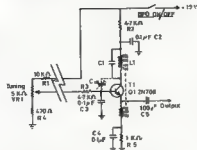
the first out of the junk box. In point of fact, the poorer quality germanium transistors exhibit a greater tuning range due to their higher initial junction capacitance, however ± 3 Kc. was obtainable very easily at 500 Kc. using the 2N708. About the only real re-

quirement is that the transistor chosen will oscillate at the frequency being used. The output amplitude remains constant over the tuning range. Frequency stability is reasonable, excessive ambient temperature causing an increase in leakage current, being the main cause of drift.

The operation of the circuit is fairly simple. Feedback from collector to emitter via the tuned i.f. transformer causes oscillation, the frequency being determined by the value of L1, C1 and C2 which is effectively in parallel with C1. As VR1 is varied, the change in base voltage causes a change in base current, and consequently a change in the collector current. The change in collector current through series resistor R2 causes a change in collector voltage, and, as pointed out earlier, a subsequent change in the junction capacitance C_{bc}, similar in fact to the operation of a varactor diode.

Further details of this effect can be found in G.E. Transistor Manual, 7th edition, pages 20 and 21, 65.

—Douglas W. Rickard, VK2ZDI



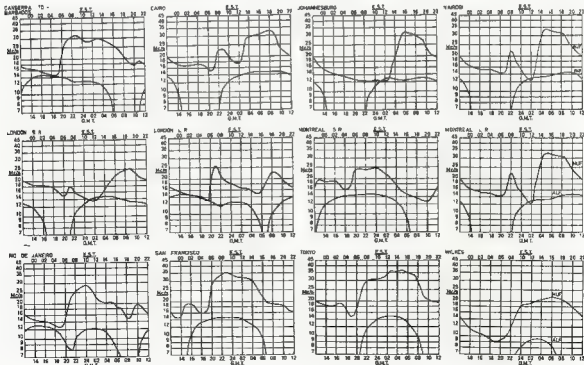
- Q1—2N708 or any transistor similar.
- T1—I.F. Transformer, e.g. 455 Kc. (transistor type). May include C1.
- VR1—10K ohm potentiometer.
- R1—100K ohm, 1/4W.
- R2—4.7K ohm, 1/4W.
- R3—4.7K ohm, 1/4W.
- R4—100K ohm, 1/4W.
- R5—1K ohm, 1/4W.
- C1—May be part of T1.
- C2—0.1 uF, paper.
- C3—0.1 uF, paper.
- C4—0.1 uF, paper.
- C5—100 pF, mica.



AMATEUR FREQUENCIES:

ONLY THE STRONG GO ON—
SO SHOULD A LOT MORE
AMATEURS!

PREDICTION CHARTS FOR APRIL 1967



(Prediction Charts by courtesy of Ionospheric Prediction Service)

SIDE BAND

Sub-Editor: PHIL WILLIAMS, VERNON

The notes this month will be not very technical, as time for the necessary research has been not available. Instead, I shall quote some items of interest from my reading of overseas periodicals, all relevant on the sideband scene.

ANOTHER U.K. TRANSCEIVER

One transceiver which I did not mention in my review of the salient features of these items 15 months ago was the "Anglian 100" made by Light Electro-Developments Ltd., in Suffolk, England. This has been modified recently to increase its power output to the 400 watts p.p. allowed by the British licence.

The equipment uses the 2.1 kc. mechanical filter for sideband generation at 455 kc. Frequency coverage of 500 kc. per band on two selectable v.f.o.s in the same slide-rule dial permits transceiver with U.S. stations operating on different segments of the bands. There are eight half-megacycle sections, the lowest: 1.5 to 2.0, and the highest 29.0-29.5 Mc. For c.w. men a half-lattice filter is added for improved selectivity on "receive".

The p.a. has four valves, type TT21, in parallel. These are the transmitting version of the audio tube, the KT68, so popular with the bass-guitar crew in the amplifiers they use to wrench voice coils off the woofer speaker cones. The box is 18" x 8" x 15" of wrap around case construction, a la Collins, with a matching power unit 8" x 8" x 15". This description was condensed from the "R.S.G.B. Bulletin" for December 1966 if you want to read more.

These descriptions are valuable for ideas for home constructors, and I must admit to having second thoughts about a few items for incorporation in my long-minded project, the transistorised s.s.b. transceiver.

FIELD-EFFECT TRANSISTORS

Following on the success of that little handful of receiver, the "Davco," recently reviewed in the American magazines, there are several small receivers under construction in this country. Small prefabricated modules are available. There is a beautiful little 3 watt audio amplifier little larger than a matchbox which feeds an 8 ohm speaker directly, and is ideal for the project. Integrated circuits—all moulded into the one chip will give all the gain you can use after the main filter, in one stage at 455 kc., and perhaps two stages, gain controlled, at 9.0 Mc. For the front end of the receiver there are quite a number of field-effect transistors suitable for use up to 30 Mc. with minimum cross-modulation with quite strong local signals. With a strong b.c. station (50 kW.) just over my back

fence, the use of transistors requires more than normal selectivity in the input circuits.

A little over a year ago, imported FET's were more expensive than many of us care to contemplate, but now some audio types are available very reasonably in this country. This has had the affect of increasing the duty on imported v.h.f. types which are not, as yet, available from Australian sources. The "customers" should learn to distinguish between various types and applications of equipment.

One can only hope that some v.h.f. type FET's are soon available locally from those who are "protected" by the higher duty rates. The situation should then "right" itself as far as we poor experimenters are concerned.

A FIELD-EFFECT VALVE

"CQ" magazine draws attention to the development of this device by (I think) Amperex in U.S.A. It is obviously in the experimental stage only, but has extremely high power sensitivity and linearity, so with a few hundred milliwatts from a fully transistorised exciter it should be possible to produce a high p.p. output of s.s.b. in the single tube amplifier.

I am awaiting more news of this one with anticipation. The very high-powered transistors are not yet, it seems, for Amateurs, except for the lucky ones who have access to the "just outside" rejects. Too much optimism may be unwise, for the price of the F.E. valve may be a shock to the system.

HEATER/CATHODE EMISSION

We have used oxide cathodes in valves for as long as I can remember, back around 1930. These were a considerable improvement on previous emitters, and more easily managed than even modern thiovalent tungsten emitters in modern tubes. In the Jan. 1967 issue of the "Scientific American" magazine there is a reference on page 59 to work done to improve the emission of cathodes. This refers briefly to the development from fundamental principles, of the dispenser-type cathode, in which the necessary barium is not contained in the surface oxide layer, but in a chamber with a porous tungsten "lid". This separates the emitting surface from the barium, resulting in higher emission at lower temperatures and much longer life of the emitter.

Figures of up to 40 amperes per square centimeter are quoted, with a life of 100,000 hours at 1 ampere per sq. cm. Since high peak emission is one of the features required for linear amplifier valves for s.s.b. p.a. stages, we can look forward to some interesting developments.

NEW CALL SIGNS

DECEMBER 1966

- VK117—R. G. Bell, 53 Valley Cres., Campbell.
VK117—J. G. Frickie, 27 Foynton St., Hughes.
VK1WT—W. R. Taylor, 13 White Cres., Campbell.
VK1ZAN—B. C. Elliott, 37 Ingalls St., Garton.
VK1ZC—A. H. Hennessy, 23A New Hawera Rd., Mexley North.
VK1ZAW—A. H. Wam, 1 Cannons Pde., Forsterville.
VK1ZAK—K. W. Kiding, 10 Alexandra St., Drummondville.
VK1BA—R. J. Miras, 23 Plateau Rd., Springfield.
VK1BDF—D. Freeman, 13 MacNamara Ave., Concord.
VK1BGL—J. Leatham, 2/31 Arcadia St., Coogee.
VK1BHF—J. J. Freeman, 80 Nymboldi St., South Coogee.
VK1BNF—N. V. Finnelly, G.P.O. Hotel, Bradbury St., Cooma.
VK1BPC—P. Greener, 44 Cabbage Tree Lane, Fairymead.
VK1BRL—R. F. A. Lopez, 49 Desborough St., St. Marys.
VK1BSS—North Shore Radio Club, C/o, 11 Ruby St., Mosman.
VK1ZG—J. J. Milburn, 31 Makin St., Dee Why.
VK1ZGY—R. R. Glover, 30 Saltash St., Yagoma.
VK1ZLP—D. L. Price, 353 Lakemba St., Lismore.
VK1ZQB—J. C. Bedford, Station 13 Cumberland St., Terahill, Station: C/o, Mrs. W. Smith, Carrington, Singleton.
VK1ZSU—J. F. Sutcliffe, Station: Mobile: Postal, P.O. Box 130, Darroch.
VK1ZXP—P. H. Casara, 2 Scarborough St., Kogarah.
VK1EL—G. J. Maroon, 26 Darling St., Mosman.
VK1QQ—R. H. Roark, 50 Churchill St. Mont Albert.
VK1AMG—M. Barry, Station: Portlisle: Postal: C/o, C.R.A.E., 26 Collins St., Melbourne.
VK1AVI—Royal Victorian Institute for the Blind, 180 Box Hill Boy Scout Group, Burwood Rd., Burwood.
VK1ZV—D. Patterson, 33 Cullenbena Ave., Oakleigh.
VK1ZAV—D. Chick, 15 Vida St., Essendon.
VK1ZUJ—A. J. Lascaris, 1 Naria Crt., Glen Waverley.
VK1ZUJ—A. Duck, 24 Mall Crt., North Blackburn.
VK1ZVW—C. A. G. Williams, 21 Wilkinson St., Reservoir.
VK1ZYB—M. W. Alsop, 3 Mann Rd., Nunawading.
VK1ZVQ—S. R. Goodwin, Postal: P.O. Box 91, Kanto.
VK1MX—M. T. K. Power, 3 Railway St., Buranda.
VK1AWN—J. G. Willis, 206 Wardell St., Enoggera.
VK1ZT—H. N. Sandford, 16 Loch St., Too-womba.
VK1ZCW—C. W. Brooke, 13 Simla St., Too-womba.
VK1ZAZ—P. J. Fitterbert, Station: Portlisle: Postal: Radio Section, 10 Sqn. R.A.A.F., Townsville.
VK1ZZE—A. E. Kikin, Station: Portlisle: Postal: 28 Crofton St., Bundaberg Ave., Townsville.
VK1STQ—J. J. Gordon, 7 Rawlings Ave., Townsville.
VK1ZU—J. Keight, Station: 46 Green Ave., Tuart Hill, Postal: 53 Railway Pde., Midland.
VK1ZKZ—R. J. Pether, Lot 12, Hutton St., Osborne Park.
VK1L—L. A. Comper, Berriedale Rd., Berriedale.
VK1ZRD—R. L. Davis, 746 Sandy Bay, Sandy Bay.
VK1SOZ—D. Griffiths, Station: Portlisle: Postal: C/o, Mr. A. Smith, 146 York-ton Rd., Elizabeth.
VK1N—J. Lilley, O.T.C. Cable Station, Madang.
VK1PT—P. Naylor, Station: Angus Dr., Berooka: Postal: C/o, D.C.A., P.O. Box 55, Fort Moresby.
VK1SS—J. Silver, Lot 2, Section 4, Mialhi Ave., Moroka.



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A VK2 IN W-LAND

JIM SINCLAIR, VK2ZSJ

I have had an idea in mind for some time that light, being an electromagnetic wave of very short length, may be affected by atmospheric conditions similar to those that cause v.h.f. DX. The experiment described here is an attempt to test this theory.

I am fortunate in choice of QTH in that we have a clear view of a sea horizon and that horizon is over 40 miles away. I selected a fixed point: the head of a bolt on our t.v. aerial in fact, and by measurement and calculation could set up a scale on my tower that would show the relative position of the horizon from time to time. The whole thing acted like a calibrated rifle sight grown to a 53-foot baseline so that one degree was 11.1 inch long and one mil of arc was 0.185 inch. Approximation was able to measure the relative effect from day to day, although I could still not find the absolute size of this bending.

The readings I took did vary although the variation was much smaller than I had expected. Only 10 minutes separated the two extremes that I have recorded to the present time. As one minute of arc represents about the limit of definition of my eyes, the readings I have taken can never be more than a rough guide to this effect. I have also noted long periods when based on the horizon makes its exact position indistinct. On the other hand the thing I am looking for may exist as quite a large fixed refraction which I cannot measure.

Results so far suggest a correlation with air pressure, but not exactly. It is more that the reading is high while the barometer is rising, but drops as soon as the pressure starts to fall in a rate-of-change manner.

So far I have noticed only one result radio-wise. On the morning after the highest reading I have ever recorded, VK7s were heard in Adelaide and several of the south-eastern boys were worked at quite good strength for the first time in several months.

To test for correlation I would be interested in reports of 2 mhz activity in the coming DX season. Apart from the contacts you make, I am also interested in those you hear and also in those times when regular contacts are weaker than usual. Please, however, be honest and accurate with your signal reports otherwise you become just another statistic that does not fit.

While one obvious practical use of this effect is to predict band conditions, there is another point worth noting. If, as I suggest, light is bent by a tropospheric scatter force there is no reason why the effect should not exist on all the frequencies between 100 megacycles and 100 million megacycles; in other words, the u.h.f. microwave, and infra-red bands. 2 metres could in fact turn out to be one of the least active bands in this regard and we may be timidly probing the edge of a vast field.

Having long had a desire to visit the U.S.A., on July 30 last I took advantage of a discount fare and Qantas Boeing VHEIK started me off towards San Francisco at 600 m.p.h. My first Ham QSO (VK2OP) was made on 1st April, which means I'm still in the honeymoon stage. But naturally I was keen to meet North American Amateurs for some eyeball contacts

Duga was arranged with a friend once miles out from San Francisco. My only preparation for the job was to turn up at the house where the party had turned out. I only spoke to one telephone QJ. At the summit of a steep hill in Lafayette, where I was staying, I could see the city lights and the beams of the searchlight metre beams. I learned that this was the QJ of Ed WEILSD, a tremendously enthusiastic amateur astronomer who had been involved in contest activity with the thoroughness of a legal brief. His success was apparent as I saw his name on the list of winners of the winner VK-2Z. Contest, etc.). His Collins K-line enabled me to make a contact with Bill WYATT, a well-known amateur astronomer and equipment, for which Ed is local agent. He ran a v.h.f. transceiver, an oddish Navy receiver of sentimental value and a miniature transmitter. This latter was a small unit to be monitored. At 1.20 a.m., when Ed dropped me off in his Cadillac, we were only

One day as I was coming out of Elmar Electronics in downtown San Francisco, I saw a Ford Mustang at the curb sporting a custom loaded vinyl top and Mammut spare tire. As I walked into the cabin of the Mustang, I lowered the window with a "Hi" (hot day, air conditioned car) K8 Just Doting Fine offered to take me around town and search for some of the freestyle crystals needed. I gave him a few more couple of days and he was to come to call Harold in Los Angeles on 40 mc sideband. Harold obliged with a phone patch to a local supplier and the crystals arrived C.O.D. a few days later. All done at 60 m.p.h. down the GREENY.

Len, during his daily travels as an independent engineer, kept watch with his Drake on the Northern California emergency net. After taking a short break from his travels, he returned to a road accident. I spent two days riding around the San Francisco Bay area in the search for a suitable place to set up camp. Elmer, where I met Bill WESAI, Escondido, EKFJF was controller on the Golden Bear Net, and I was able to make a few contacts. The Voice procedure on the Golden Bear and 9 p.m. Western Country Cousins Nets was almost a common foot. Phone patching was commonplace. EKFJF's home QTH was a house trailer set up on a foot. The house trailer was parked in the rear corner of the trailer camp allowed an inverted Vee to straddle the back fence. It was to my advantage. I was able to make a little crowd. I was away with a 20 watt portable a.m. all-band tx and rx. This was typical of U.S. Elmer generous hospitality. I was able to make a few contacts. The foot is old hat. Even the Canadians, I found later, filed a pair of snowshoes to beat the

After two weeks around San Francisco, a Qantas Boeing took me up to Vancouver in one and a half hours. A month before my sister had written she would meet me at 10 p.m. on the corner of Twelfth Avenue and Granville. As the airline bus dropped me off on the way into downtown Vancouver, I could see her waiting across the street. I was five minutes late.

WADSWORTH had asked me to look up VETAKH. Always a Kindling Blonde, (Brunette or Babe?) he was a real warm hearted character. He had ten kids and a Viceroy IV on sideband (Icelandic Set Back, he called it) He had a rather unique certificate amongst his awards. He'd worked in States, FL, VA, and VETAKH was very proud of his rig, even reckoned his Drake IV had a W4 fillet. I saw a lot of Vancouver and the surrounding suburbs as Lex took me here and there on the side of the road.

Beautiful British Columbia, as the car number plates declare, is an apt title for this lovely area. Late Saturday night we called in on VSTR8H. Al soon had us sipping Silver Bullet from the bottle tops. Al had the Drake twins nicely housed in the operating deck, with the r.t.t.y on his left. He was going for the 600 watts, so I said, "OK, you're OK." I had my bug to call a few VKEs, I had to make the weights right down to the slow end. Even with the heavy linear (600 watts), the K9 Contest best me and I couldn't get a QSO. I was talking to Al and he was band and soon I was talking to Don VK2PU.

\$3000, played second fiddle to a whole row of Collins desk-top units. Before I left Vancouver, Les presented me with a small Canadian flag, their new design. He had flown it from his car antenna on numerous field day sorties into the U.S.A. It's on the wall of my shack now.

In 25 hours the Continental Trailways Bus took me back to San Francisco for \$51. I flew right down through Washington, Oregon and Northern California the weather held fair and the Hostess plied me with donuts and hot chocolate. I had to leave for Sydney before my reciprocal licence came through, but when it does (there's a 90-day wait!) I'll stick it up here in the shack. Maybe I can use it next year.

Back in the home QTH, the old home-brew 50 watts looked pretty sick by comparison. Still tonight I just got a 97% from WAFD. But I'd just hooked up my new multiband trap antenna. Where did I get the traps? Well, that's another story.

DAVE VIKERS,

"SUPERGAIN" ANTENNAE

(Continued from Page 42)

in copper elements having a diameter of 1 centimeter and operating (ratio of power radiated to power supplied) of the 9-element array would be vanishingly small—something like one billionth of a millionth of one per cent.

The calculation also shows that the efficiency is pretty close to 100 per cent, using the same type of element, when three elements or less are used. With four, it drops to a few per cent, and decreases rapidly thereafter.

Although somewhat different numerical results are to be expected in the case of the end-fire array, which is a much more common type in Amateurs circles, the results mentioned above nevertheless typify the trend as an attempt is made to get more and more gain from more and more elements in a given small space. There is, it appears, no substitute for size if gain is to be secured under practical conditions. For receiving, too, the "effective area" of the antenna must be considered; this depends pretty largely on the physical size and an antenna must be big in order to intercept much of the energy of an incoming wave. As someone once expressed it, the antenna has to be big enough to "get a good grin on the ether".

—T. T. Tatham, VK2TQ

NON-DELIVERY OF "A.R."

If you are not receiving your copy of "A.R." please follow these steps which will ensure the correct procedure is followed; any attempt to short circuit the system will only further delay matters.

Write: to your Divisional Secretary advising non receipt of "A.R."; do not write to "A.R." The Divisional Secretary should write to the Circulation Manager "A.R.", P.O. Box 36, East Melbourne, C.2, Vic., advising him of the problem. Unless this advice is received before the 8th of the month, a further month must elapse before the member can be re-instated upon the circulation list.

Please ensure that you always advise your Divisional Secretary in writing, verbal advice will not do.

* Reprinted from "The South Australian Wireless Institute Journal," January 1967.

CAMP TECHNOLOGY 1967

For the third year in succession, Camp Technology was held at Mount Victoria in the Blue Mountains of N.S.W., during the Christmas holidays. Camp Technology, an enterprise rapidly growing in popularity, is sponsored by the world wide I.S.C.F. (Inter School Christian Fellowship) movement and is designed to cater for high school boys from 2nd to 5th year who might be interested in electronics or photography as a hobby or a career.

Conceived by a Sydney engineer, Camp Technology is an addition to an

very successful erection and operation of a three element 20 metre beam. Using a Swan 350 transceiver, and operating under the Camp Technology call sign of VK2BCT, excellent contact with most parts of the world was maintained throughout the camp. One of the most interesting contacts was that with Keith VK2AKX, who was holidaying in Japan.

Toward the end of the camp, many of the boys sat for the elementary and junior examinations set by Youth Radio Scheme organisers of the W.I.A.

The first camp held in 1964 attracted 14 boys. For the 1966 camp, 60 applications were received and 14 applications had to be held over till next year.

All the above activities were integrated into a programme which included daily studies in the Christian faith, in which the relevancy of a personal faith in a technological age was demonstrated.

After all, "Man shall not live by bread (or even electronics) alone, but by every word that proceeds from the mouth of God".



Making a DX contact.



"The Grange", the site of Camp Technology.

already well established series of Summer Camps, which each year draw hundreds of teenagers into various types of athletic and cultural activities.

During the recent camp, 46 boys, 14 officers comprising a scientist, engineers and technicians, and a variety of electronic and photographic equipment found its way to "The Grange"—a large property at Mt. Victoria where, for nine days, the boys took part in various projects in the fields of communications, industrial electronics, computer circuits, tape recording, servicing, electronic music, and still and movie photography.

From a communications point of view, a highlight of the camp was the

Technical Correspondence—

ARTICLES ON TRANSISTOR TRANSMITTERS

Equipment Exchange Bulletin,
P.O. Box 177, Sandy Bay, Tas.

Editor "A.R.," Dear Sir,

I am very pleased that there were only few requests for copies of articles mentioned in my letter in Jan. "A.R."; I was dreading the flood of work anticipated. On the other hand, I am rather disappointed by the silence, if it indicates a lack of interest by Australian Radio Amateurs in transistorised circuitry for transmitters. Here, therefore, is a bit more information to spur them to greater interest in this subject.

While reviewing it I was staggered by the amount of reading I am going to have to do in detail if we are to treat it adequately in print. Several articles in the "R.S.G.B. Bulletin" make that thin magazine worth the price of the membership, and of course "73 Magazine" leads the field in America, notwithstanding its remarkable editorials (some of which sound almost reasonable!).

In the following list, I should not take too seriously the plethora of transistor types specified. Items locally available from Philips/Mullard and

Fairchild ought to prove adequate for experimenters willing to study characteristic sheets and prices, not to mention the 2N2991, etc. The AUY10 and SE3035 ought to be of particular interest, but experimenters should note that the very low output impedance of the high power SE3030 will pose some serious problems of peak ratings and power transfer, which should be approached cautiously and competently.

It should be noted that useful material is also available from the "QRP Bulletin" (ref. VK5BS or W9YZE), and that a long and extensive bibliography on this subject appears in the excellent article in October 1966 issue of the "R.S.G.B. Bulletin".

Whew! If anyone knows of any more good practical references, would you please let me know this kind of information about them? In addition, there are Application Notes by Fairchild, G.E., Motorola and Philips, etc., available on request on company stationery; write first for list of titles available.

R. L. Gunther (VK7RG).

[See opposite page for a comprehensive list of references]

SUBSCRIPTIONS DUE

All members of the W.I.A. are reminded that annual subscriptions are now due and should be paid promptly to their Divisional Secretary. Non financial members will not receive a copy of "A.R.," and back copies may not be available upon request. To preserve continuity of your files of "A.R.," please pay your annual subscription now.

ARTICLES ON TRANSISTOR TRANSMITTERS

Magazine	Date	Title or Information	Final	Input Power	Tr.	Mode	No. of Pages
"Am. Radio"	11/65	Transistor Transmitter for 144 Mc.	AF102	30 mW.	2+	Ph.	3
"	8/66, 10/66	80 and 40 Mx Special (from "CQ" 4/66)	PADT50	20 W.	4	Cw.	3
"Break-In"	10/64	A Transistor Final Amplifier (Debugging Modulated Transistorised Tx's)	AUY10	6.5 W.	2	Ph./Cw.	2
"	9/65	The Behaviour of Transistors in Class C Amplitude Mod Service (a pessimistic view)					
"CQ"	9/61	75 Mx Mobile	2N1046	(Thanks to John Adams, VK3)			
"	4/62	Zener Diode Transmitter*	1N1605	(Thanks to John Adams, VK3)			
"	1/66	Simple R.F. Output Circuitry Design for Transistors. (good)					
"	6/66	A Compact 40 Mx Transceiver (with a note about silicon versus germanium)	2 x PADT50	29 W.	4+	Cw.	5
"Electronic Circuits Handbook" (Cowan, 1963). Section 3: Four tx projects.							
"G.E. Transistor Manual," 7th Ed. In chap. 2, "Considerations of the Transistor's Frequency Limitations," and p. 386: Low Power A.M. Broadcast Band Xmitter plus 100 mW. V.f.o. C.w. Tx.							
"Mobile News"	8/64	Proper PI-Network Design.					2
"	5/66	180 Mx Transistor Transmitter	2 x AUY10	8 W.	7	Ph.	5
"QRP Club Bulletin": Good circuits appear in this from time to time. Send \$US2.00 to W9YZE for membership; it is well worth it, both in principle and practice.							
"QST"	9/56	"CQ TR" 7 Mc. M.O.P.A.	CK761	QRP		(Thanks to J.L.)	
"	12/61	The Imp Transmitter				(Thanks to J.L.)	
"	5/64	All Transistor 50 Mc. Phone	2N2219 (2 W.)	(Thanks to John Adams, VK3)			
"	3/64	7 Mc.	T1486	(Thanks to John Adams, VK3)			
"	4/66	180 Metre "Solid Status"	2 x 2N1212	36 W.	4	Cw.	5
"	10/66	Low-Priced Premium Transistors for Amateur Applications.					
"	11/66	A One-Watt Rig for 40 Metres	2N697, etc.	1 W.	2	Cw.	2
R.S.G.B.: "Amateur Radio Circuits Book," three transmitters, p. 86, 87, 91. Otherwise mostly valves.							
"R.S.G.B. Bulletin"	3/65	10 W. Transistor Tx for 160 Metres	2 x AUY10	10 W.	5	Ph./Cw.	3
"	3/66	The G3SBA Top Band Transmitter (But see also p. 484 in July issue)	2 x BFY51, etc.	10 W.	4+	Ph.	6
"	5/66	QRP Transmitter				(Thanks to VK3BT)	
"	5/66	Low Power Transistorised Transmitter	QRP				2
"	7/66	Low Power Transistorised Transmitter 160 Mx 10 Mx	AUY10 FSP95	3 W. QRP	4+ 2+	Ph. Ph.	2
"	9/66	8 W., 160 and 80 Mx Tx by G3BIK	2 x 2N3053	8 W.	6	Ph./Cw.	1
"	10/66	A Layman's Approach to a Simple Transistor Transmitter (excellent general article)	2N3053	4 W.	2	Cw.	7
"	10/66	Half Watt 2 Mx Transmitter	2 x 2SC32	0.5 W.	6	Ph.	1
"Selected Semiconductor Circuits Handbook" (Wiley, 1961), chap. 4: H.F. Amps. (theory useful).							
"Transistor Radio Handbook" (Editors and Engineers, 1963), chap. 5. Theory plus ten projects							
"Transistor Transmitters for the Amateur" by Do nStoner, W6TNS (published by Howard Sams, U.S., No. TT8-1).							
"73"	9/64	Complete 50 Mc. Station	2N2876 (2 W.)	(Thanks to John Adams, VK3)			
"	4/65	Transistor R.F. Power Amp. Design (good)					3
"	7/65	2 Metre Transistor Transceiver	AF102, etc.	50 mW.	4+	Ph.	6
"	8/65	Simplified Solid State: 2 Metres	2N1744, etc.		1+	Ph./Cw.	2
"	9/65	Evolution of a Transistor Tx	3 x 2N416	1 W.	6	Cw.	6
"	10/65	2 Metre Solid State Walkie Talkie	5YL4221	120 mW.	3+	Ph.	6
"	11/65	6 Solid Watts on 160	2N1907	6 W.	3+	Ph.	3
"	1/66	A 6 Mx Solid State Peanut Whistle (transceiver, self contained)	2N1143	400 mW.	2+	Ph.	4
"	2/66	The Astro Ten (10 Mx)	2 x 2N697	180 mW.	3+	Ph.	3
"	7/66	Designing Tr. R.F. Power Amps. (another good one, with complete design example at 50 Mc. and don't you dare change that to Hertzies!)	2N3553	QRP			5
"	8/66	Another Solid State 2 Mx Transmitter	2N3564	430 mW.	3+	Ph.	2
"	11/66	Streamlined Modulators (series)		1-2W.	2+	Ph.	2

* Author was "Dr Shorna Gitchagooms" and was in April issue; is it a joke? The only problem is that this is exactly the same idea which was developed independently recently by one of our readers (A. Gledhill, from VK7), and a prototype was tested successfully. The idea of using the sharp back bias characteristic of a zener to amplify power does sound reasonable, and ought to be investigated further.

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

APPRECIATION

Editor "A.R." Dear Sir,
I wish to sincerely thank VK3AD, Rick Lake, for his technical and other assistance rendered prior to my Lord Howe Island trip in November, 1967. His technical and other assistance rendered prior to my Lord Howe Island trip in November, 1967. His technical and other assistance rendered prior to my Lord Howe Island trip in November, 1967. His technical and other assistance rendered prior to my Lord Howe Island trip in November, 1967.

—Arch Hewitt, VK3KK

EQUIVALENT FOR P4D70 TRANSISTOR

Editor "A.R." Dear Sir,
In reference to your reprinted article, "The 40 and 40 Transistor Special," I have contacted Mr. John S. Hill, the author of the article, and I have enclosed a xeroxed copy of the literature received.

The A470 transistor which is the Philips equivalent of the P4D70 is available from Philips. These are in stock in Sydney and may be ordered through any of Philips distributors.

Hope that this information may be of use to you.

—M. J. (Mike) Groth, VK2ZMG

[The information referred to above has been retained by "A.R." Anybody interested can contact us.—Editor.]

IONOSPHERIC PREDICTIONS

Editor "A.R." Dear Sir,
Thank you for publishing in the January issue of "A.R." an excellent article by Frank Hine, VK3QL, on the subject of Ionospheric Predictions.

I have been interested in this subject for quite some time and this is the first occasion that I have been able to find such a wide variety of information under one cover and written in a way that everyone can understand, particularly in the matter of extracting information from the charts.

The amount of research undertaken by Mr. Hine must have been enormous and I should like to congratulate him on a most informative article.

—Warwick Johnston.

PROPAGATION OF AMATEUR SIGNALS

Editor "A.R." Dear Sir,
Many thanks to Mr. F. T. Hine for the excellent article in January "A.R." I hope you can persuade him to write again in future and would be grateful to see him deal at greater length with shorter distance communication up to 3,000 miles. How does one choose the best frequency, and in particular what are the advantages and limitations of v.h.f? How does the W.I.C.E.N. net plan for, say, Sydney to Melbourne communication?

Also, I would be very interested in an article comparing the performance of f.m. and a.m. practical Amateur operating conditions, if ever you have an opportunity to enquire a suitable author.

With many thanks for producing such an informative journal.

—E. J. Pottage, VK3FG

"THIS PARADE OF EXPERTS"

Editor "A.R." Dear Sir,
I see in the March issue (DX Notes) that the back room boys are not painting an over optimistic view of the next summer's DX season. This is strange, as just last week I was reading of an expert who had just predicted that the next maximum would be the highest on record. But really, as we all know this parade of experts has been going on for several years now, each predicting something different. There are probably so many different predictions by now that whatever happens, someone will be proved to be a good prophet.

It would suggest Mr. Editor that it would be a good move if you were to insist that any such long range forecasts you publish must come with the expert's name coming in for hard cash bets that he will be right or wrong. The professional ionospheric services would probably offer 20 to 1 on next summer's forecast and maybe 4 to 1 for a six month's forecast, but decline to bet on anything longer. These odds are just a guess as they depend on exactly what was agreed on as to the meaning of being right or wrong.

On the other hand if long range forecasts of the next summer's maximum were coming in, then the problem of "A.R.'s" finances are solved, if the experts offer better than even money. I am sure you would be happy to put

half your kitty on this week's expert at better than even and then the other half on next week's expert who predicts the opposite, so that you make money wherever turns out to be right. But if they just offer even, then save space by not publishing their "forecasts" since they themselves have no confidence in their own forecasts.

Why are there this deluge of predictions? Not because of radio propagation but because at this next maximum men will be going to the moon through the solar radiation. And someone, somewhere, at about now, is having to decide how much radiation shielding they should carry with them. Too little for the solar maximum will cost lives, too much will cost billions of dollars or roubles wasted. I feel sorry for this unknown decision maker trying to decide which experts guess will be best.

—Alan Head, VK3AKZ

NEWS ITEM

Editor "A.R." Dear Sir,
Morton Brewer, W8JU, and Mrs. Marion Brewer will pay a short visit to Australia in December 1967. The visit will only be for three weeks and he will spend about a week in Victoria.

Morton is second engineer to John Knight, W5YX, who is chief engineer of KNBC Ch. 6, Los Angeles.

John Knight was out here for a couple of weeks just prior to the Ch. 6 allocation on a survey check for one of the applicants for that channel.

—John Murray, VK3AFJ

SUGGESTIONS

Editor "A.R." Dear Sir,
May I suggest the following ideas for your already excellent magazine —

1) A Questions and Answers Column
If a pond of experts cannot be found or co-opted to do the answering, may I suggest the readers of your journal will probably be only to willing to have a go and you can pick the best answers for publication.

2) Articles Requested List
If your readers are asked regularly to write in and tell you of any particular articles they would like to read about, and if you published a few items requested now and then, I am sure you would find many Hams who would write the articles requested.

I would like to start the ball rolling by asking the following question.
28.96 to 27.23 Mc. is one of the allotted Ham frequencies. Are there any Hams on this band, and if so what are they operating? Would any Ham on this band please let me know?

Bob Callander, VK3IAQ

[It's up to our readers.—Editor]

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One of the most interesting events for the Y.R.S. in N.S.W. recently was the exhibition of gear at the W.I.A. Convention at Durral. This was organised by Ivan VK3AB and was a good example of what success the Y.R.S. is having and augurs well for the future. There were organised by Ivan VK3AB and 4, Camp Technology, the Kingsgrove High School and Westlakes Radio Club. There were several contests held during the day, which proved very popular. The crystal wiring contest was won by Jim Mathews in 47 seconds and the memory contest by Clark Gerber. On the construction side, the junior section (under 14) was won by Mark du Cross for his light sensitive relay. The senior section (over 14) was won by Douglas Friend for his television set and...

Some of the other projects on display were several I-translator sets, crystal sets, Morse oscillators, an electric "tic-tac-toe" board and a television camera using a mechanical scanning device, photo sensitive transistor, inter-com, the A.W.A. flip flop and an alarm. All in all, it was a mighty effort by the boys and by Ivan for putting everything into excellent order. It was a very hot, humid day, but this did not deter the enthusiasm of the boys. The tent was crowded at all times with adults as well as the boys. This is the sort of event which could help Y.R.S. tremendously and it is hoped other States will follow suit in some way.

To help with the training of club members, Y.R.S. has started a programme of supplying electronic kits-as these become available. To date a Phillips EE/20 has been supplied to Phillip EE/30 to Maitland Training School for Boys, an Eveready Kit to Keith Howard for allocation to a suitable Hunter Valley Club and a General Kit to Clontarf Park Radio Club. Of course, this project is severely limited as Y.R.S. is not a very financial organisation. In addition, the available number of "ready made" kits have been issued to clubs on a loan basis. For example, audio oscillator kits, crystal set kits, conductivity kits, telephone kits and similar sets of parts have been distributed to many clubs. These kits remain Y.R.S. property and are subject to recall if the clubs cannot look after them.

In addition, many issues of donated gear have been made. For example, Kippings Boys' High has received a Gelson v.d.o. transmitter, North Strathfield Scouts have a low powered transmitter (formerly used by Bass Hill High School Radio Club), Clontarf Park Boys' Brigade have an old 332 transmitter (i.e. operated) and a Type 3 Mk. II, etc. The gear which was being used by the former Illawarra Youth Radio Club has been re-allocated. Scopes soldering irons have been distributed to various clubs. This part of the Y.R.S. operation is becoming a special job and a volunteer with plenty of space and time would certainly be appreciated.

In 1961 there were five clubs associated with Y.R.S. In 1962 there were just six in NSW alone. Rex Black, our travelling supervisor, should be congratulated on the tremendous job he has done to instigate the Y.R.S. and then have it going so fast in a comparatively short time.

Camp Technology was very successful again this past summer with 48 in attendance at the 3rd camping camp from Victoria. Mr. T. Mayne, Smr. has very generously donated a Swan 336 transmitter for the Camp and with the loan of a three element beam from Amalgamated Wireless, the boys were able to work stations from all over the world. From this standpoint, of course, the Y.R.S. has a very good record as a spot for DX.

VK1 Len Whyte of the Canberra Youth Radio Club has received his first class VK1LN and is putting out a good c.w. signal on 80 mc. Len passed his A.O.C.P. last April and has been patiently waiting until the 1st of 18 (early in February) to get on the air. Another Canberra boy, Richard Swan, has just received word that he passed the A.O.C.P. at the January 1st examination this year and no doubt is on the air by now.

VK2 Ray Carpenter of Westlakes Radio Club has gained the A.O.C.P. and has received a copy of the R.E.C.B. Handbook, O.T.S. and a large box of parts from the W.I.A.

VK3: Howard Rider advises that the Victorian Division of the Y.R.S. has received a club call sign of VK3ANE, and that Don Reid,

VK3KE, is responsible for the station and its operation. Slow Morse broadcasts will be conducted for members in the Junior and up group very shortly.

Last month we mentioned that a very attractive lapel badge for those who have obtained an elementary certificate or higher would soon be available. I understand that this is to be of March. Also, there is now an embroidered pocket badge which should enhance a jacket very nicely. This is available now to members who have obtained the junior or higher certificate at a cost of \$1.00.

The S.W.I. Group publishes "Zero Beat" every two months and after the April issue the Y.R.S. Newsletter will also be being an a.w.I. is very interesting and an important step in acquiring the ticket.

I would appreciate receiving news about Y.R.S. activities from all States by the last Wednesday of each month or before if possible. Please send to Mrs. M. Swinton, P.O. Box 1, Kuluara, N.S.W. or, Mona VK3AB.



Publications Committee Reports

The Publications Committee met a week earlier this month as the normal meeting night fell on a public holiday. It is, therefore, possible that some mail meant to reach us by the second Monday is not included in this report.

Technical articles were received from VK3IAU, Z210, JADA, ZKRC and 688.

The story of the Robert Ship was submitted by Grah Johnstone, VTZKJ. (VKPSB will please note.)

Correspondence was received from VK3BAQ, ZFG, 3ACM, 3AJY, 3AKZ, 3ZKJ, 3ZIM, YUGOV and C. Christiansen.

Some time was spent discussing the only item on the Federal Convention agenda of direct concern to the Committee. As we have a file on this subject it was decided to make this the basis for our contention that a new method of handling the annual mail decisions is desirable as the present method is an unreasonable state of affairs as far as our circulation manager is concerned.

We were pleased to welcome VK1LL to our meeting, when we had the opportunity to discuss with him a suggestion he made several months back. The committee made the decision to discuss his suggestion with the printer who will give the suggestion further consideration.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. Position in the list is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total D.X.C.C. credits given, including deleted countries. Where totals are the same, the member will be alphabetical by call sign.

Credits for new members and those whose totals have been amended are also shown.

PHONE

VK3MS	214/232	VK3JZ	308/281
VK3AHO	313/322	VK3ER	301/277
VK3RU	300/314	VK3TL	254/254
VK3AB	299/300	VK3D	252/270
VK3EMK	286/315	VK3APK	238/239
VK4PJ	275/282	VK3ADE	232/237

Amendment:
VK4DO 168/280

G.W.

VK3KE	319/343	VK3AGH	378/282
VK3K	325/313	VK3CN	285/286
VK3ADE	291/313	VK3D	282/270
VK3CK	281/312	VK3RU	256/277
VK4PJ	287/300	VK3DR	246/263
VK3AHR	281/288	VK3TL	246/266

Amendment:
VK4DO 184/301

OPEN

VK3AGH	308/326	VK3BO	285/286
VK3ADE	305/326	VK3ER	278/281
VK3RU	303/326	VK3ACX	278/281
VK3EMK	300/315	VK3TL	274/282
VK3CN	294/326	VK3IA	272/278
VK4PJ	289/312	VK3TL	272/278

Amendment:
VK4DO 204/284

CONTESTS

"CQ" WORLD WIDE S.S.B. CONTEST

Freeds of Sales

Contest period: 0000 hours GMT, 8th April, to 2400 hours GMT, 9th April.

Frequency: 3.5 to 28 Mc.
Mode: Two-way s.s.b. only.

Exchanges: RS report plus the usual 001, 002, etc.

Scoring: (1) Contacts between stations on different continents, 3 points; (2) Contacts between stations on the same continent, but not in the same country, 1 point; (3) Contacts between stations in the same country, no contact points, but count towards prefix multiplier. Multiplier: One point per prefix worked irrespective of band.

The total score is the total contact points multiplied by the sum of different prefixes worked.

Logs: Use a separate log for each band. Logs to be postmarked no later than May 15, 1967. Address: "CQ," 14 Vanderventer Ave., Fair Washington, New York 11050. Attention: W.W. S.S.B. Contest.

Awards: Certificates to highest scoring single op. station in VK for highest score on each single band or for highest all-band score.
N.B.—The full rules appear in "CQ," March, 1967, page 84.



P.A.C.C. CONTEST 1967

Freeds of Sales

Contest period: 1800 hours GMT, 29th April, to 1800 hours GMT, 30th April.

Frequency: 1.8 to 30 Mc. Cross-band contacts invalid.

Mode: Any, but cross-mode contacts invalid. Exchanges: RS (phone) or RST (c.w.) plus 001, 002, etc., for VK stations. PA stations will be the RST or RST plus two letters indicating their province.

Scoring: Two points for receiving a number plus 1 point for receiving confirmation of the number transmitted—thus each confirmed contact scores 3 points.

The multiplier is obtained by adding up the number of provinces worked on each band. The maximum multiplier is 58.

The final score is the QSO score for all bands multiplied by the multiplier.

Logs to be postmarked not later than 15th June, 1967 and addressed to Mr. F. V. D. Berg, PAJVE, Contest Manager V.S.R.O.N., Kesterstraat 41, Gouda, The Netherlands.

Awards: Certificates will be awarded to the highest scores in each VK call area for both c.w. and phone.

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Sub-Editor: ALAN SHAWSMITH, VK8SE
25 Whyolpi St., West End, Brisbane, Qld.

Many reports this past month give details of openings on 31 and 25 Mc. There is no doubt that old Man Kora is now being indulgent to the poor mortals who pursue DX via the m.u.f.

15 Mc is now open daily to diverse places; firstly, U.S.A., Central America and northern parts of South America from 2300z. Later, the 15 appears and stays audible into the night. From 0500, the Asians appear, followed by Europe. The band finally closes here around 0300z.

10 mc, although much quieter, has been following the same pattern roughly. Firstly, around 0100, U.S.A. and VE's appear, followed by J's then Europe between 0100-0200; after this, the band appears dead.

It is very encouraging to say the least, if conditions steadily improve then our next spring-summer-autumn period may see some real activity on these bands. QRT's will remember with drooping anticipation the brisk state of 10 mc immediately post-war.

To verify these reported openings, both from overseas and local, some time was spent on these bands and at QTH they exceeded expectations. It was possible to QSO Europe nightly 0900z here, on 10 mc, those using the quiet and quiet settings in routine 58 dip-switch as OH1VR. However, just to prove that QRP gets places when the m.u.f. is at ten, CATT, 1000, was working daily, using 100 watts to a dipole. The coming winter months may take the life out of these bands, but it is anticipated that next spring will bring some promising results. So wind that extra coil and see what you can do.

31 Mc is quite crowded at 1600z, with Europe easily workable, as well as Africa and Asia.

NOTES AND NEWS

Trinidad: As Cohen: Alan EDWEN is active on 14135 and listening about 14300 from 2100z. QSL W2GKH. (LIDXA)

Algeria: Is: Tom VRYIC is on every Monday 2020 2100z c.w. and then moves to 21250 2100z. QSL WATJA. (LIDXA)

Gilbert Is: Paul VRIC GRV 14166 and listen 14166 up about 14185 transmits, from 0400 to 0500z. (LIDXA)

Kermadec: ZLIAJ is still active at 0600z. Now sends 14100z. (LIDXA)

Bramel: Mike V5SMR is reported on every Wednesday, 14100 1520z. QSL WIDGJ.

Crete: Bill V5GWL was around 14300 at 1900z. Also 20000 at 1800z. QSL W5CXC.

Masequarie Is: Rod VKUCR 14180 0800z, also sometimes 14070 c.w. QSL G. Johnson, Ingles St., Newtown, Hobart, Tas.

1A3B30 Operation. This occurred from Clifton Is. for a period of two hours 1600-1800z. By chance, you may manage a QSO, send the QSL to Bill Rindlen, WABSO. (LIDXA)

Nicaragua: YN6AV 14180z and elsewhere after 1900z. In Aquileo Vazquez, Chinandega, Nic. (VK4UC)

Salvador: Y51VST 14150 0400z. QSL, Box 888, San Salvador.

Honolulu: Oia: VK3AJH/5 is active from here for only a few days. His next DX-pedition is to Nauru if he can make it. (VK4UC)

Alcatraz: These and more are QRV from here. KH5HGP/KLT, W4FAY/KLT, KLTFFP, KLTFFP, KLTFFP 0700z around 14100z.

Cape Is: TH6JC 14100 at 1300z. (VK6MY)

Grenada: VP2GHI 14140 0700z. (VK6MY)

QV6LSE on c.w. around 14000 most days at 0800z.

Bonair Is: Activity by F5EBS has now concluded. Max is activated again, later.

Gilberts: Z3JAM 14030 at 0700z. (VK6MY). Also activity from this spot on 21 and 35 Mc. 0800z.

Yemen: 4WIK/HBAAT QRV 14130 1800z. QSL HBAAT. (GUJUT, "Ali Waves")

Thailand: HS2NT 21 Mc. 1100z. (GUJUT)

London: ZD9G and 2400z 2000z. QSL K02NZ. Will be here for a year. (GUJUT)

Garban TRSAR 14024, 2100z. QSL Box 212, Libreville (GUJUT) Also TRSAG, 14140, 0700z. (VK4UC)

Ivory Coast: TURAY 21 Mc. a.s.b. QSL Box 20194, Abidjan. (GUJUT)

Leeward: Z3JAM and 2400z 2000z. QSL VK2JVA and VK2KZ will be active May 8-13. Original time given was in June. One stipulation is that no calls will be answered on

transmitting frequencies. QSL P.O. Box 323, Springfield, N.S.W.

Tahiti: FO8BR, 14118 c.w. 0800z. (VK6MY)

Also PQ4AA almost daily, 14-1500 GMT, mainly 1400z c.w. (VK6MY)

Qatar: Ray V5BAR is ready to begin operation from here, on final approval from the Chief of Police. QSL via V5BAR.

Afghanistan: Wolf V5ABQ quite active on 14213, 0300 GMT. QSL via DLAME. (LIDXA)

South Georgia: Dave V5IIE on daily, 14200 0700z. (LIDXA)

Galapagos Is: HC0FN 21000 0100z. QSL WA-2WU. (LIDXA)

Kanara Is: This trip was cancelled due to political instability. His V5BALV will now attempt operation from FLA. (LIDXA)

Madagascar: Z3JAM and 2400z 2000z. QSL is to be planning a journey here.

New Hebrides: FR5AG and Y5BSW both very active now. The former 1400 1900z, and the latter on most bands at various times.

Santa Leone: SL1JM, ex PAUL, Sundays only, a.m./c.w. 7 and 14, 0900-1300z. QSL SL1JM. (LIDXA)

Tactical Omsa: MP4TBO 31400 1400z, also 14110.

Vanuatu Is: VP6GJ 14000 0700z. (GUJUT)

Cape Verde Is: CR6CB 23 a.m. CRAAJ, CR6BA 14 and 21 a.s.b. CRAAB 14 c.w. (GUJUT)

Betawan: Z5SD and Z5EL QRV from here shortly. Keep an ear open.

Crest: Is: F5W5W 14166 1800z and c.w. 1400 1300z. (GUJUT)

Pakistan: AP2NKC 14180 1400z. QSL is AP-25G. (GUJUT)

Medina: Hal CTAS very active 14 Mc. c.w. and a.s.b. (VK1TL). Also worked here on 7013 at 1500 and 21 c.w. He is on 35 Mc. c.w. at 0800.

The following are a few random extracts from George ZLAAPZ, DX Editor of "Break-In" who supplied a very comprehensive DX report:

Rep. of Algeria: TX0AR, Harry ex DLJAN, 14118, 21 c.w. QSL P.O. Box 2, Maison Blanche.

Newfoundland: VO1HB, M180, also VO1PB 1900 at night.

Bahamas: WIDEL/KSS, 14330. QSL to Box 8, P.O. Page.

Cyprus: ZC4CI on 14150.

Cuba: CO2DR, M180, QSL Box 600, Habana.

Venezuela: VY5AE, 14130. QSL Box 3038, Caracas.

Bahamas: MP4PFX, 14110. QSL to WCTN.

Bong Kong: V5W5F 14180 QSL Box 23, Hong Kong.

Porto Rico: KP5CHL, 0822z, 1400z.

Tripoli: SA4TH, 2130z, 14115. QSL Box 600, Tripoli, Libya.

Florida: New Is. still in California, plans to move to West Africa early March.

Bermuda: VP5WB, 14000. QSL Box 275, Hamilton, Bermuda.

Bahamas Is: V5W5W, 14040, 1520z.

Maraca Is: K06IF, 14300. QSL to WSANS.

Walvis Is: F5WRC, 14130. Reported active during week-end.

Turkey: T2AC, 14050. QSL to K4MCM.

British Guiana: New prefix is N1R1.

Tasmania: Z2AZ, 14115. QSL to W0BBE.

Greenland: OX3BO, 14030, 2000z. Curtis Carter, Box 1900, 1983 Comm. St., Apia, N.Y.

N.Y. 8002z.

Vietnam: K1YPC/V5 14 c.w. and a.s.b., also all bands and modes.

Indonesia: W5GTA/57R. All bands, modes.

Don Miller, W5WVY. This globe trotter moves too fast for this column. It is not possible to predict just where he will be when you read this column. He has worked St. Brandon Is. are the next on his list. Then Tromelin and Cayster Reef and on and on. Just keep an ear to his fax or for a pile up.

F.A.O.: New C.S. V5GKZ/57R. Capt. J. P. Swaleski, K4ZLS, Rq. 5th Air Force, Box CW, A.P.O. San Francisco, 96333.

REMARK: This station sends out test signals around 0900z on 2000z. Reports to D.A.R.C. are requested of its reception. (Heard here regularly)

Canada: Centennial Year: As reported earlier, V5s for this year of 1967 are permitted to use the call 3C. Lot of them are doing so on all bands.

ACTIVITIES

Ken VKYTL has not been so active these past few weeks. However he still notched these good ones. 30 c.w./a.s.b.: CTAS, HB-4DRH, VK3AA received VK3AH (Northern).

VK3HJ/1, VP5CJ, VK3AA received 3C, 5C, 6C, 7C and 8C. VK3AA received VE-6B (Baltimore Is.), MP4BQ, VP5BQ, OX4M/1, 14, VO1AW, Z3JAM, V5GKZ/57R, V5GKZ/57R, W5GTA/57R, V5EJ, Z5GIC, VP-2EM, CTYA, VP5R, SUSDB, etc.

Don K4EYJ landed these on 14 Mc. a.s.b.: H5K1Y, Z2LIA, V5GKZ/57R, Z2LIA, 180-VW, VK2AF/V5 1300z, ZGRIAR (14100), 08110, UW5VT (14100 1312), D5PFE (14100 1300), P251B (14110 0835), V5IC (14115 1005), T-

WJC (14100), S2ABG (14137 2110), YUCC, P18R, 4X6W, KH5HGP/KLT, W4FAY/KLT, KLTFFP, etc. These were heard on 20 a.s.b.: P7YTL, KCBW, ZCAGB, UC4AA, TRSAG, FO-58B, VPLAB, S2ABG, ZLIAJ. Mostly around 0700z.

Chas. VK4UC now using a Bruce Array on 20 and finding it an improvement. His score this month using his usual QRP was as follows: Y51VST, TG2PF, TG4RH, TG1A, P5OC, KA-LE, KV4CK, K2ZUS, DUBPC, FLARA, KE-LID, HCIMF, K2ZUS, KPAZ/57R, P27T, HBZAVI, 4X4WN, 4X4VY, H51JM, L23KZC, Q50ED mainly between 0700 and 1300z. (Thanks Chas.)

SOME Q7RS

HCIMF-W5P7L

SMILE-FVINT

HS1JM VK4M, CTAS-GMY or R.S.G.B.

S2IAAF-N7VIO, S2IAAF-V5I, KPAZ-V5P7Y, Z5EL and Z59D-WABRE, VK3RJA-W4CZ

SK5AW-Box 543, Kipari, Grand, Z5HAM-EX G5JPF via R.S.G.B.

V51VST-Box 558, St. Salvador, V51VST-EX ZL2NS, QSL to home Q7R, V51VST Embassy of Canada, New Delhi.

SUMMARY

Several letters this month complain of the ever increasing commercial QRM problem. It is a month about now that is starting on all bands, but what can be done or what is being done? How many are legitimate? Who are the bootleggers? Which are operating in Region 1, and so on? Geo ZLAAPZ reports a lot of this type of QRM on the high end of 21 Mc. 50 and 40 metres become simply crammed to the limit as the night progresses. I hear quite a few unidentifiable signals on 30 metres at various times. I notice too that during contest and other periods of high activity many of these stations just disappear. Draw your own conclusions.

My thanks again to the column's supporters. Don't leave me, keep sending in whatever you have please. 73, Al VK4BS.



MP4TBO TRUCIAL OMAN

A familiar voice from the Oil Sheikdom, Roger Baines operates from the state of Sharjah. He is a member of the Trucial Oman Scouts, a member of the Peace Force from the British Government. The gear in use is a KW4000 on 180 degrees and a P-4100 400w on P-7. T432. Roger says if you think it's been hot this summer, the temperature at his QTH goes to 130 degrees F and very humid. He rates Jan VK3MO, who uses a three element QSL, as the best signal out of VK. Give Roger a call, he always eager to rag chaw with Oceania. Send his QSL to MP4BWW or VK4JAZ.



CONTEST CALENDAR

- 8/9th April: "CQ" World Wide S.A. Contest.
- 29/30th April: P.A.C.C. Contest 1967 (VERONI).
- 13/14th May: N.Z.A.R.T. Sangster Shield (S.S. Mc. only).
- 8/9th July: N.Z.A.R.T. Memorial Contest (S.S. Mc. only).
- 8/9th July: S.E.G.B. 18 Mc. "Summer" Contest.
- 15/15th August: Remembrance Day Contest.
- 7/8th October: VK/ZL/Oceanic DX Contest (phone section).
- 14/15th October: VK/ZL/Oceanic DX Contest (c.w. section).

CLOSING DATES FOR COPY TO V.H.F. SUB-EDITOR

Correspondents to the V.H.F. Page are reminded that the Sub-Editor must receive their notes by the following dates:-

April 29	August 16
May 27	September 20
June 24	October 18
July 28	November 25

Remember also, all copy where possible should be type written on one side of half a foolscap page (8 1/2" x 11") with a one inch margin on each side, and double spaced.

Westlakes Radio Club. I notice that the V.H.F. scribbles was not among the official guests, maybe they don't know about V.H.F. in those parts. 72, Mac VK2ZMO.

FEATHERS

Activity in VK3 over the past month has not been the level where one has to look for a vintage v.h.f. copy, but rather, the average v.h.f. could average four or five contacts a night if he wanted.

The A.M.S. in this month has been the efforts by the W.I.C.R.N. group in Melbourne during the big bush fire on the Peninsula. The W.I.C.R.N. group has been the as the disastrous fire in Hobart. The evening of that day, whilst monitoring 3 f.m., 50 and 100 metres, and the 5 m. band, some mobile were seen operating in the Hobart area and the Melbourne mobiles and fixed stations gladly kept the net clear to avoid interference. 72, Cyril VK3ZCK.

QUEENSLAND

At the January v.h.f. meeting our former scribe, Peter 4ZPL, tendered his resignation. We were sorry to see Peter leave Brisbane, but no doubt he has made many friends in Townsville by now.

At this meeting, Roy 4ZRM was elected President, and a hearty vote of thanks was given to the retiring President, Mick 4ZAA. Roy 4ZRM was elected Hon. Secretary, and Roy 4ZRM was elected Hon. Treasurer.

It was also decided, in view of the activity on the v.h.f. bands in Queensland, that the Queensland group should follow suit and actively participate in similar experiments. Subsequent to the group project, it was decided to establish 6 m. men on 5 m., and 2 m. men on 432 megs. Altogether, 13 units are to be made. Roy 4ZRM has made available his workshop facilities at New Qld.

At the moment of writing, the 438 Mc. project is under way. David 4ZDF, Ron 4ZCB, Roy 4ZRM and Mike 4ZAA turned up for the initial construction meeting of the project. The project was fully discussed at the Feb. v.h.f. meeting when Roy 4ZRM introduced several suitable circuits to the members. The "Break-in" circuit successfully used by the Christchurch, New Zealand, V.H.F. Group, was chosen for the 438 Mc. band. It is a three transistor converter using AP72Ls, with a total chassis space of 31 inches square. It is very reasonably priced.

Laurie 4ZEL was going into the matter of antennae on behalf of the group. Speaking about antennae, Bill 4ZED very generously gave away his 16 ft. beam for the 438 Mc. group. It was a case of first come, first served. Bill's stipulation was that the recipients must first signal him to get the beam.

Forthcoming events, involving the International Scouts' Convention at Jindalee from 18th Dec. 1967, to 6th Jan. 1968, was talked about and this brought back memories of other days. There will not be an Easter Scout Convention as the International Convention is to be the event. Mick 4ZAA said that he could expect 4,500-5,000 Scouts from all parts of the world. Mobile and portable rigs will be the order of the day, as will be the case with the Final plans have still to be formulated.

Our attention was also drawn to new stations at Townsville, Clifton, and the North Coast. A special place was put in for John 4ZGZ and Arthur 4ZE at Southport and Labrador respectively. They would like to work local and long distance. They are both very keen on this direction.

The serious problem of L.v.I. on 6 m. band is still a matter for further discussion above, in the meantime all Queensland amateurs are requested to stay off the band during television hours. There are two exceptions to this but for further information please contact the Secretary of the V.H.F. Group. Please remember that your non-operation in this matter will possibly affect us all.

Dane 4ZAX donated a kaper towards the beacon project and it is now hoped to finalise the practical details in the next few days. In his report, the President thanked all those who contributed equipment and parts to the project. It was a good example of the Amateur spirit.

Graham 4ZGZ is currently re-broadcasting the Sunday morning 80 m. news on 3 m. After one or two initial problems, the news came, the news comes over loud and clear and after last Sunday's news quite a few 3 m. stations were able to pick up the news to Graham for providing this facility.

If any Amateur is interested in our v.h.f. projects, it is certainly invited to contact the V.H.F. Group in Brisbane through the Divisional Secretary, W.L.A., Box 433, G.P.O. Brisbane. We will do what we can to assist. 72, Alan 4ZAX.

TOWNSVILLE AND DISTRICT

Southern DX has decreased rapidly during the past few weeks. In opening occurred on 28th Jan. when WGBAR maritime mobile was worked at 1345 E.A.S.T. Channel 6 stations continue to be heard but no sign of any Amateur signals except for 8ZKW and 4ZGA at 1100 to 1300 E.A.S.T. on 14th Feb.

Northern DX shows promise with early afternoon openings on 20th Feb. Activity was monitored from 1100 to 1300 E.A.S.T. followed by a JA opening at 1330.

Local news. Welcome Peter 4ZPL (ex Brisbane) to the northern gang. Graham 4ZGZ is back from his annual holidays, while Phil 4ZB is back from his annual holidays. Phil was recently elected president of the local radio club. Congratulations to Lance 4ZML, who recently passed the Morse exam, and closed out on 100 WPM.

Ayr-Rose 4RO and Dale 4ZDG have their new shed almost completed and signals once again are being radiated. The signals on 6 m. have improved since the new beam was put in operation.

Porters 4ZB and Bill 4ZK have been heard operating on 6 m. with his dipole aerial. The locals are hoping to work Bill when he puts up his new yagi. Hope it will not be long till as we would like to work him 50 miles on both 6 and 8 m. 72, Bob 4ZRG.

SOUTH AUSTRALIA

The most recent meeting of the VK3 V.H.F. Group took the form of the Annual General Meeting. The report by the retiring chairman, Peter 4ZED, was well received. There was plenty of praise and criticism was levelled in the directions where it was correctly right to do so. It was most apt to realise that the state of v.h.f. Amateur activity in VK3 has not been all "peaches and cream" over the last year. However, the majority of the chairman's report concerned the achievements of the Group, namely the re-commissioning of the beacon transmitters and the conduction of the first successful band activities.

At the conclusion of the mandatory business the election of officers for the ensuing year was fully carried out, and were as follows:- Chairman, Eric 4ZED; Vice-Chairman, 4ZSK; Secretary-Treasurer, Jim 4ZSJ; Councilors, Barry 4ZMW and Bob 4ZDK. As usual, the election of all officers was most successful primarily due to the lack of numbers that attend the A.G.M.

Band activities, apart from an occasional six or two m. DX opening, it could be said that short of administering the license rules for v.h.f. activity in VK3, there is little to do. The use of the band for a consulting thought on the subject can be obtained from the knowledge that television activity is still in the air. Of late George 4ZG has been radiating an excellent t.v. signal of high quality, to the various members of the t.v. group.

In general the outlook is most depressing at the present moment, however next month could reveal an entirely different picture. 72, Colin 4ZEL.



AWARDS FOR TECHNICAL ARTICLES

The awards for 1966 were decided at the February meeting of the Publications Committee. The vote taken at that time resulted in awards being made to:-

Harold Hepburn, VK3AFQ
Roger Harrison, VK3ZRY
Phil Williams, VK3NN

The awards have already been sent to these gentlemen.

Sub-Editor: CYRIL MAUDE, VK3ZCK
1 Clarendon St., Avondale Heights, W.V. Vic.

News time is here again. Well there is not much to say except thank you to all those contributors who have sent in typed or legible news this month. In this edition of A.R. is a list of copy dates for "A.R." for the rest of this year. Just one thing more. Not only do the other sub-editors and editor would very much appreciate it if all copy could be typewritten on half a foolscap page and double spaced with one inch margin at each side. 72, Cyril VK3ZCK.

NEW SOUTH WALES

The VK3 New Year Field Day results were mixed but not despicable, so I am unable to include them. (Sub-Editor)

The Field Day distances were checked with a 1.C.D. 1-1000 map. Among the notable contacts was one between Eddie VK3V/P and Alec VK3AAK at Kulnura, a distance of 110 miles, on 432 Mc. Ray VK3TN at Birchcreek worked VK3B/P at Mt. Conobolas. To all those who participated, the committee wish to say thank you, and if you have not been in a Field Day, well give it a try next year. Talking of field days, it is felt that the ethics of Amateur Radio are degrading when a transmission is made for a 3 m. net which is at a well known convention.

The VK3 V.H.F. Group certainly counted their blessings over the year. The new law struck Hobart. It was most gratifying to see the Amateur services doing such fine work, helping with the emergency communications. To the V.H.F. group, who have been one of our best 73 and our donation of \$10, hoping it will be of some assistance.

The section is becoming very popular as we now have four very capable operators in 1ARF, 1AHW, 1PG and 1ARY. The session starts at 800 hours most week nights.

Band activity is a little slow, possibly because of the Morse session, but will no doubt address itself for a number of months. For fun, it is not so popular as it used to be. The 3 m. fox hunt is held on the fourth Wednesday in each month. The next hunt will be on the 4th Sunday following the V.H.F. group meeting. 72, Stephen 4ZSK.

HUNTER BRANCH

35 Mc.: During the month things have been quiet, the last DX was on Jan. 23 when some VK3 and 4Z were worked. Nothing else, only lots of tuning and calling when Channel 9 was heard.

The big surprise of the month was working Jim 4ZPL on this band. Jim was working mobile on the S.S. Carcanta. He was worked many times by the local 35 Mc. gang. He said that he had been in the bush for his home QTH in Nourmes and hopes to have both 144 and 53 Mc. gear when next in these waters. He also hopes to have better gear for home station and work some VK4 from his home.

VK3 2ZWM, 1AYF and yours truly 2ZMO can usually be heard on the Saturday and Sunday nights. The 35 Mc. band is always free to do so. Quite a few are either at getting ready for, or repairing gear after field days.

We from the Hunter Branch extend our sympathy to the VK3 boys in the disastrous Hobart and district bush fire.

Mike 4ZEL's opening have been bad on this band. Sydney has been coming in well and most of the boys have got among the boys. Mike 4ZEL's opening have been bad on this band. Sydney has been coming in well and most of the boys have got among the boys. Mike 4ZEL's opening have been bad on this band. Sydney has been coming in well and most of the boys have got among the boys.

Most nights this band is rather quiet with only a few boys. But on the nights when there are a few locals to be heard usually, 2ZSG, 2ZWM, 2ZMO, 2ZFX and others when work permits.

Barry 4ZMW is known as the "Red Trap" because he has recently acquired his c.w. and is awaiting a full call. He is a building, but he is also ready to lend the r.f. on 14 Mc. but will move than likely trap the birds.

John 4ZGZ in Midland is starting a radio club and guess who is teacher—none other than Kevin 2ZKW. The official opening was on Friday, 24th Feb. Among the official guests was 2ZSK. Secretary of the Hunter Branch, and Keith 1AAX, of the



FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL QSL BUREAU

The QSL Manager for Israel writes: "I am asking your help for a human operation. There is a 12-year-old woman in Israel who lost her son in the Second World War. The postage took her son away in Warsaw in October 1943 and since then she lost all contact with him. She heard about the Radio Amateurs, and she is asking our help to find her son. His details are Michael Lieberman, born Nov 1931 in Moscow, father Boris and mother Shoshie Lieberman. We would like to ask you to do all you can to find any trace of him (will you please look in the phone book and directory) and send any information to Mrs. Sola Balke-Lieberman, 33 Palliser Rd., London, W14, England."

The Annual U.S.S.R. DX Contest is scheduled to be held from 1000 GMT to 24.00 GMT, May 1. All bands 3.5 to 26 Mc. may be used and the mode is CW only. U.S.S.R. stations will send RST plus the number of his region, while DX stations RST plus usual serial number. Contacts may be made between any two stations except those in the same HP. Contacts between stations in the same continent count 1 point. Contacts between stations in different continents count 2 points. Scoring will be any period of 12 hours' operation will count. Logs to be sent to Box 45, Moscow, by 1st June 1967. Prizes will include the 1st hour prize of 1000 rubles. Awards to the first five highest scores in each country. Further information may be had from this Bureau.

Home-Brew Award. This is an award in Amateur awards. Date, only U.S.S.R. have been issued to VK stations. For W1-38. Certificates, send direct to W1EML, the following: photo of Amateur Station, 1000 rubles, built to code and rx (no kits) and one I.R.C. to cover return postage. Applications to be sent to Al Bray, c/o W1EML, 1 Wappingers Falls, New York 12550, U.S.A.

Ref. para these notes, March "A.R." regarding proposed visit to UK by G.K.R. Bill Connolly, VK3JL, has been asked to accompany him to make a new routing, leaving here on 11th March but not going to Australia. This will make a 1000 mile more leisurely trip possibly next year. Please advise VK3JL, VK3AHO, VK3NR, VK3JG, VK3ATN and VK3AIA.

Advance information on the 1967 QRP Club's QSO Party from Q2s, Aug. 18, to 23s, August 18 to 19. Further details will be published later.

QSL Traffic through this Bureau continues to increase heavily. Cards handled during the last month of February totalled 16,496, the highest monthly total ever recorded in the 34 years' records. It represented an increase of 15 per cent. over any previous month.

—Ray Jones, VK3JL, Manager

NEW SOUTH WALES

The programme of lectures for the VK3 Division's monthly meetings provides that at least one lecture during the year will be given by a member of the V.H.I. Group. And so it was that on 12th October, 1966, a lecture by about "S.B. at V.H.I." at the February meeting, before an audience of about 50.

Before calling on the lecturer, however, the President (Mr. VK3OD) announced that a presentation had been arranged for that evening, the recipient being Peter Cairns, a lad who had received his Q.C.T. in recognition of the Institute's Youth Radio Scheme. The prize had been purchased from funds donated by the Telecommunications Commission and the chairman extended a cordial welcome to Messrs. E. Knowles and R. Baty, representing the Commission, and to Peter and the speaker, Ivan VK3AIA, for arranging the presentation.

In presenting Peter with a transmitter manual, Mr. Baty mentioned the donating funds to the Y.R.B. the Commission was mindful of the fact that they and other large employers of labour in the field of electronics and communications would reap much benefit in return. It was only by encouraging youth to take an interest in these things at an early age that the necessary man power would be forthcoming to fill the ever-increasing need for technicians. As a result of the excellent start this lad had made, Mr. Baty said that the work was doing very well as a junior technician

with G.T.C. and Mr. Knowles offered him heartfelt congratulations and best wishes for a successful future.

Peter made a suitable response, particularly mentioning the work of the V.H.I. supervisor, Rex VK3YA.

The lecturer, Keith VK3EAO, began by stating that the official term of transmission of intelligence was c.w., followed by s.b. d.s.b., w.b.f.m./s.m. and n.b.f.m., in that order. For the purposes of this lecture, however, attention would be given to those systems allowing direct transmission of speech.

Comparing a.m. with s.b., it was shown how the latter achieved its superiority by getting rid of the characteristics that swallowed up so much power—the carrier, for instance, with further efficiency being gained by transferring all the intelligence into one sideband.

A further advantage in s.b. transmitters was the greater ease of switching power levels for short or long distance working. This was one of the appeals of s.b. as the signal may be generated at very low levels, then amplified to the desired output level with linear amplifiers.

For best results on both v.h.f. and h.f. bands, a receiver should have a low noise figure and good selectivity. Many of the better s.b. mod. some Amateurs realise the inadequacy of their present receiver, then the 1st receiver they purchase should be progressive in addition to drift in tuneable receivers, it was amazing how many v.h.f. converters had an oscillator injection which was far from a TV noise.

A considerable part of the lecture was devoted to ways and means of bringing receivers to the standard of the day. The reception of s.b. signals. In addition, a comparison was made of reception with the standard detector and h.f.s. as against the more common method of incorporating a product detector.

The various points in both receiver and transmitter design were dealt with, with the aid of large circuit drawings. Keith had prepared his lecture thoroughly, in great detail, and at its conclusion, thanks were offered by Harold 2AAM who was well supported by the audience.

Apologies for non-attendance came from Peter VK3JF and Warwick Johnston. The latter indicated that he was willing to continue with the positions of registrar and co-editor of the Bulletin. The Bulletin has also been acting lately as minute secretary at monthly meetings, is one of a small band of stalwarts without whose help the work of the Division would come to a standstill.

Applications for Institute membership were received from the following, and they were duly accepted: Pull member, Paul Moore, Gordon Cliphams, VK3JL; Associates—Milton Moore, Robert Hazelwood, Kevin Hannan, Reginald Connolly, John Briar, Ernest Allard.

President Tom reported that during the month the Federal President (Max VK3E2S) and Federal Secretary (Peter VK3EJ) paid a visit to Sydney and met members of Council and the Constitution Committee. The main purpose of the visit was to discuss various problems that had arisen in regard to the proposed Federal Constitution.

A member of the Constitution Committee, Bill VK3YH, gave a resume of the most controversial matter discussed. As a result of these discussions it was felt that members of Federal Executive would now have a better appreciation of the reasons behind the N.S.W. Division's stand on these matters.

With regard to the bush fires in Tasmania, m.v. we take this opportunity of offering the deepest sympathy of all VK3 members to our Tasmanian friends in their tragic losses, both in lives and property.

The President reported that four Amateurs had been among those whose houses

had been completely destroyed. (One Amateur, Mr. M. K. Koglin, VK3TK, lost his life in the bush Area.—Editor.) Federal Executive had instituted a W.I.A. Bush Fire Fund and it was hoped members would contribute liberally to it. Donations could be addressed to the Federal Executive, W.I.A., P.O. Box 50, East Melbourne. The VK3 Divisional Council had made an initial payment of \$10 towards the fund.

Continuing with the interview, the visitor expressed disappointment at the response to the I.T.U. Fund, particularly by the larger Divisions. Later, when dealing with the future of Amateur Radio, Max stressed the danger to the Amateur Radio movement, particularly in Region 3, by the emergence of Asian countries who were pressing their demands for more recognition. He stressed that it was a matter of urgency that Amateurs should populate the bands to a greater extent and contribute to the I.T.U. Fund so that we would have representation in the fight over our bands.

We have already referred several times in these notes to the well-equipped library at Wireless Institute, 1000, Chesham, Bl. Cross Nest. This has been installed and built up for the benefit of all members, and it is very disappointing all considering that greater use is not being made of it. Keith VK3UE is doing a good job as librarian and he would like to see the library more fully stocked with available books. While on the subject of the library, Adrian VK3HE has donated a complete set of "CQ" magazines covering a period of 15 years. Many thanks, Adrian.

On Sunday, 11th Feb., we donned our skin-diving suits and joined the crowd heading for the Gosford Field Day. Even torrential rain could not dampen our Gosford friends, who have a reputation for turning on one of the most popular field days we know. A change of venue was made from the Racecourse to the Showground, where there was more cover and the programme went on as planned. In spite of almost continuous rain, the attendance was over 1000. The rain did not prevent several members from the place. We noticed Tex VK3AHF, a KI mobile marine, while Arthur VK3EJ, returning home to Inverell after an interstate pilgrimage searching for steam engines, stopped off at Gosford for the field day and was welcomed with a warm handshake with a few 80's. T. Ivan VK3AIA.

HUNTER BRANCH

The Annual General Meeting of the Branch, which was held on 10th Feb., was a very successful one. The usual democratic affair with all positions being filled in record time. Other than for the securing of several points, election posters were the calling order during the night several times during the two and a half minutes of the election time, everything went very smoothly. Divisional President (Frank O'Donnell) took the chair during the proceedings, and with the assistance of the meeting, created one new post of great importance to the Branch.

The retiring President (Frank RAO) had expressed the wish to assist Amateur Radio in any way possible but he had been asked to resign. The Branch was so pleased that he had not enough time to devote all his spare time energies to Branch affairs. In view of this, some standing order, Mr. Paterson. To this he agreed and was duly elected at the meeting. This new office is one of considerable prestige and it is fortunate indeed that the Branch has such a capable man as Frank to fill the position. With his long record of public service and his deep concern for the Branch, it is a pleasure to have him as the man for the job and we all wish him well.

Another Frank, this time 32FX, was elected to the position of Branch President. A relative newcomer to our hobby, 32FX has shown himself to be intensely interested in the hobby and the Amateur Radio scene. A man the Branch has much to look forward to. In the long line of Branch Presidents who have served our hobby in this area in the past, it is a pleasure to have a man of such calibre and commitment to their liking, because the remainder of the executive were re-elected. Bill 32T and Keith 2AUX, Hon.

SILENT KEY

It is with deep regret that we record the passing of:

VK3ADQ (ex VK3LI).

C. L. ("Lytle") Rogers.

VK3OK—Lloyd Brien.

VK7MK—M. K. Koglin.

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missed by many.
 But, I will find a way to end the notes. They
 must always end cheerily, and the only cheery
 thing I know of is that I will be going on my
 holidays next week, and therefore the notes
 next month will be written by that dozen
 of the quack-quacks, none other than Compa
 SEF. He does not know it yet, but give it
 time—and don't believe a word he says about
 me. He suffers from halloo—hallooism—
 quackism—oh dear, oh dear! T3, de SPS,
 Paul & van.

WESTERN AUSTRALIA

If there! Well with Easter out of the way for a while, and the Federal Councils safely returned to their respective States (I hope) we can settle down to contemplate the coming of winter. For many, the winter season is a time of waiting, of idleness, of idleness, of the lounge room. In some cases it is a time of inspiration during which out come drawing board, etc., and weird and wonderful ideas. In others it is a time of waiting for winter chills and ills and sit for hours in the shock "rag chewing" on 80. Just as well, too, someone must keep the bands alive, and must make the old "chew" a little more "Use them, or lose them." Winter time also affords us a good opportunity to catch up on some of those constructional projects we have

[illegible]

Ah well, we can't all be blessed with bright vision like some of those well known "bird watchers" among the v.h.f. fraternity.

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Those ever-busy Narrogin boys recently conducted another Ham Fest. Fun and games were had by all those who attended, although the attendance of "city slickers" was disappointing. To say the least, I believe that attempts to play "heraldic music" (trumpet tunes) were not fully appreciated by a rudely awakened gentileman from Katanning. This same somnambulist was the lucky recipient of the booby prize—a far lined "Gazunda"! Guess you never had it so soft Herb. What's a "Gazunda"? Oh, come come, now chaps.

Sorry to hear that life member Bill 6WF, has been on the sick list again of recent times, as has been Clem 6CW. Pleased to note that Mike 6QJ has returned to W.A. after a bout of surgery in the Eastern States. To all those on the sick list, we wish a complete and speedy recovery.

Noticed a very nice piece of cubical quad gracing the QTH of Allan 8MO, recently—look to your laurels you DX bounds.

Bill 8DR is very pleased with his present beam, after being unfortunate to lose a three element beam to the forces of nature.

Good luck to Vic SVK in his new job. Hope that all turns out well for you OM.

One of my v.h.f. gang friends (yes, I still have a couple) tells me that Mick SFP is making his presence felt on 6 mhz these days. By the way, does anyone ever tune above 55 M.

well. Davey growl about the misfortune which befell that chap up in the foothills of the Darling Scarp, you know—Bob EDDY Well, during the midst of a QSO he had a visitor from the States, a fellow who was a little like you say, but get this, wise guy. This visitor was an OWL. Of course, Bob could do little else but let him in. After all, the poor fellow was a little bit of a bird, and he had with him those two very knowledgeable chaps with whom Bob was in contact. Somewhat overcome by the brilliance of the States illumination (which was a little different from the glow of the Park Trotting Track), the visitor flew back and forth causing Bob to cut short his "over." The visitor, however, was not to be deterred. East chaff bag, he was soon forcibly ejected, leaving behind a swag of feathers suitable for mounting inside a cushion. Toward the end of the evening, however, a fellow came something about being chased by a polar bear.

It is understood that among the victims of the fire which swept Tasmania recently were some fellow Hams who lost everything. An Appeal has been launched in this Division and I commend it to your further attention. Let's see if we can help these chaps get on their feet.

News to hand that VK6CE is again active on the bands after quite a long spell. Watch for this station he is a pirate!

Congratulations to Jim 6RU on attaining his majority. This is Jim's twenty-first year as QSL Manager for VK6 Division. Many thanks from all concerned, Jim, for a job well done. May the next twenty-one years be just as

Another "Thanks for a job well done," to Laurie **SZEA**, our Youth Radio Co-ordinator, who has been tying up a few loose ends before heading over the reins to Jack **SBT**.

TASMANIA

This month has been one of the busiest seen by the Institute in Tasmania for quite some time. As well as the usual meetings throughout the State, there was the Annual General Meeting and Dinner and, of course, the bush

So much has been said in the recent past about our W.I.C.E.N. network, that I will spend little time on it now. There were roughly twenty mobiles and quite a few more home and portable stations participating, and all of them involved, congratulating and on a very fine effort. I believe a report is being prepared at the moment, giving a detailed account of the set-up, and it is hoped that this will be published soon in this magazine.

Because the Federal Convention will be held in Hobart later this year, it was necessary to put forward the date of our own Annual General Meeting and Dinner. This was held in Hobart on 28th Feb., and, as usual, a good time was had by all. Several members from the Northern and North-Western Zones were present, and Ken 3AFJ was an unexpected but very welcome visitor.

The Council for this coming year is as follows: Phil TZAX, Terry TCT, Ian TZZ, Ted TEJ, Tom TAL, Geoff TZAS and John TZJG. A new name amongst this list of usual hard workers is Phil TZAX who has just completed a law degree at the University and is now back into the swing of things—radio-wise.

The Division has also obtained a new Secretary, Ted TER. All the best to you in this

post Ted and our thanks to the retiring Secretary Crosby NCH for a job well done.

In conclusion, it is with regret that we record the passing of the late Merv. Koglin, TMK, who lost his life in the recent fires. Although not active, Merv. had a great interest in the affairs of the Division and in radio

generally,

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